The Ecomodernists | Autism Wars | Fake Vaccine Injuries | Homeopathy Lawsuit | Ancient African Wisdom?

Skeptical Inquirer

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Vol. 42 No. 6 | November/December 2018

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Inquiries from the media and the public about the work of the Committee should be made to Barry Karr, Executive Director, CSI, P.O. Box 703, Amherst, NY 14226-0703. Tel.:716-636-1425. Fax: 716-636-1733. Email: bkarr@centerforinquiry.org

Manuscripts, letters, books for review, and editorial inquiries should be sent to Kendrick Frazier, Editor, Skeptical Inquirer, EMAIL: kendrickfrazier@comcast.net. Mail: 944 Deer Drive NE, Albuquerque, NM 87122. Please consult our Guide for Authors for style, reference, and submittal instructions. It is on our website at www.csicop.org/publications/guide.

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Skeptical Inquirer November/December 2018 | Vol. 42, No. 6

A SKEPTICAL LOOK AT UFOS AND ALIENS

34
UFO Identification Process
There is a wide variety of natural explanations for things we see in the sky that are easy to misinterpret.
JOE NICKELL AND JAMES MCGAHA

38
UFOs: Why Humanoid Aliens? Why So Varied?
UFOlogy is replete with varying descriptions of UFOs and their occupants—so much so that concluding an alien intelligence is piloting them goes against the more logical and reasonable conclusion that the only intelligence behind the phenomenon is the human brain itself.
ERIC WOJCIECHOWSKI

41
Those Supposed Aliens Might Be Worms
Many believe life on alien planets would likely include intelligent humanoids, and much of science fiction uses this idea. Based on what we know of evolution on Earth, there is really no basis for this belief; however, one supportable prediction for alien lifeform would be worms.
DAVID ZEIGLER

FEATURES

45
Arthur J. Cramp: The Quackbuster Who Professionalized American Medicine
How a pioneering physician at the American Medical Association fought medical fraud on a national scale in the early twentieth century.
ROBERT BLASKIEWICZ AND MIKE JARSULIC

51
Grand Illusions and Existential Angst
Natural illusions have impeded civilization's progress toward enlightenment for millennia. Here's an inventory of a few prominent illusions that have had a tenacious grip on our collective wisdom.

SPECIAL REPORT

12
Essential Oils: One Weird Workshop
SUSAN GOULD

COMMENTARY

14
The Salton Sea Flat Earth Test: When Skeptics Meet Deniers
JAMES UNDERDOWN

16
Thoughts on Visiting Darwin's Home, Down House
KENDRICK FRAZIER

COLUMNS

FROM THE EDITOR
Aliens and UFOs: What They Tell Us about Ourselves 4

NEWS AND COMMENT
Center for Inquiry Sues CVS Pharmacies for Marketing of 'Sham' Homeopathy / Fear of Aliens: How to Protect Alien Microbes (and Us) / *New York Times* Again Hypes Saucers / Why We're Susceptible to Fake News—and How to Defend against It / A Year Later, History Channel Mystery Remains / 'I Was There ...': Harlan Ellison Witnesses the Birth of Scientology 5

INVESTIGATIVE FILES
Arkansas's White River Monster: Very Real, but What Was It?
JOE NICKELL 18

THE SCIENCE OF SCIENCE COMMUNICATION
The Ecomodernists: A New Way of Thinking about Climate Change and Human Progres
MATTHEW NISBET 20

BEHAVIOR & BELIEF
Autism Wars: Science Strikes Back
STUART VYSE 25

REALITY IS THE BEST MEDICINE
Diving into the VAERS Dumpster: Fake News about Vaccine Injuries
HARRIET HALL 28

SKEPTICAL INQUIREE
Channeling Ancient African Wisdom—or Not
BENJAMIN RADFORD 32

NEW AND NOTABLE 58

LETTERS TO THE EDITOR 63

THE LAST LAUGH 66

REVIEWS

How We Believe
HARRIET HALL 56
Belief: What It Means to Believe and Why Our Convictions Are So Compelling
by James E. Alcock

When Psychics Come Under Control of Organized Crime
WENDY M. GROSSMAN 60
A Deal with the Devil: The Dark and Twisted True Story of One of the Biggest Cons in History
by Blake Ellis and Melanie Hicken

A Detailed Primer in Fighting Wildlife Crime
BOB LADENDORF 61
Wildlife Crime: From Theory to Practice
edited by William Moreto

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[FROM THE EDITOR

Aliens and UFOs: What They Tell Us about Ourselves

People are weird about aliens and UFOs. The topic is perennially fascinating, I know. I have been involved with it nearly my entire career. But it's one of those subjects where hope, wishful thinking, and unfettered speculation seem to overwhelm reason, facts, and evidence. The gap between what we know scientifically and what devout enthusiasts for aliens and UFOs believe or *think* they know is about as vast as the universe itself. Astronomers have been searching for any signs of extraterrestrial intelligence in the universe for six decades now, so far to no avail. But proponents assume not only that we have found them but that aliens are ubiquitous and love buzzing Earth in an amazing variety of spaceships with occupants that vary in great detail yet all seem suspiciously humanoid. It is both too much imagination and not enough imagination all at once.

In this special issue on "A Skeptical Look at UFOs and Aliens," we present three articles dealing with all these matters. The prolific investigative team of Joe Nickell and astronomer/pilot James McGaha return to our pages with a range of observational issues and their "UFO Identification Process," a kind of taxonomy of what UFO reports (and reports are all we have so far) can actually represent. It is quite a compendium. All these natural explanations need to be eliminated before jumping to the ET hypothesis. In "UFOs: Why Humanoid Aliens? Why So Varied?," Eric Wojciechowski considers why most supposed occupants in anecdotal stories of aliens visiting us are so anthropomorphic. I think you will guess why. And their fantastic machines? Why are such a wide variety reported? It would seem to imply an enormous variety of cultures coming here all at once. (Despite, again, no scientific evidence so far of any ET cultures at all.) Is faulty human psychology again at work? Then retired biology professor David Zeigler takes us on a tour through the zoological kingdom to consider what kinds of critters are evolutionarily most successful. He finds one supportable prediction for what alien lifeforms might be—wait for it—worms. Not quite the lovable science fiction movie stereotype. And don't miss space scientist David Morrison's News and Comment piece on the possibly real aliens NASA is most concerned about.

We are fortunate to have a large retinue of regular columnists. They are experts, knowledgeable in their fields, broadly and deeply, and also exceedingly good communicators. Fine examples in this issue include psychologist Stuart Vyse on the autism wars, a fight for reason scientists thought they had won in the 1990s but are now having to fight all over again; Matthew Nisbet's portrayal of the ecomodernists, who combine environmental concerns with new thinking on technology and progress; and physician Harriet Hall's report on fake news about vaccine injuries.

The skeptical movement has many heroes, past and present. After editing the article by Robert Blaskiewicz and Mike Jarsulic in this issue, I have a new one. Dr. Arthur J. Cramp virtually invented and institutionalized quackbusting in the early decades of the twentieth century. What amazing energy, ability, and creativity he devoted to it! He helped professionalize American medicine and made investigation and exposure of quackery a singular part of the American Medical Association. He is someone we all should know and remember.

—Kendrick Frazier

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Our Values: Integrity, Courage, Innovation, Empathy, Learning, and Wonder.

Center for Inquiry Sues CVS Pharmacies for Marketing of 'Sham' Homeopathy

Kendrick Frazier

At many pharmacies in the United States, homeopathic remedies are displayed side by side along with tested and approved over-the-counter medications, giving the public the misleading impression that they have also been found legitimate and effective.

The Center for Inquiry (CFI), co-publisher of the Skeptical Inquirer, has been working diligently for the past few years to make sure homeopathic remedies and other "pseudoscientific" medical products are not presented to the public in a false or misleading way. Until now, CFI's efforts have been focused on promoting accurate labeling and marketing of homeopathic remedies. It has worked closely with U.S. federal regulatory agencies such as the Federal Trade Commission (FTC) and Food and Drug Administration (FDA) to bring about improvements in that area.

Now CFI has taken the next big step. It has sued the United States' largest pharmacy chain, CVS Health Corporation, for "a continuing pattern of fraudulent, deceptive, and otherwise improper marketing practices" in its promotion and display of homeopathic remedies. It says CVS's practices "falsely present homeopathic products as equivalent alternatives to science-based medicines" and misrepresents them as effective treatments for specific diseases and symptoms.

CVS operates 9,800 stores in the United States, including sixty in the District of Columbia, where the suit was filed.

CFI filed the lawsuit in the Superior Court of the District of Columbia on June 29, 2018, "on behalf of the general public." The suit calls homeopathy a "pseudoscience" and asks that CVS be found in violation of the D.C. Consumer Protection Procedures Act and be ordered to "do corrective advertising, marketing, labeling." It calls for restitution to the public in the form of $1,500 per violation.

"Homeopathy is a total sham, and CVS knows it," said Nicholas Little, CFI's vice president and general counsel. "Yet the company persists in deceiving its customers about the effectiveness of homeopathic products. Homeopathics are shelved right alongside scientifically proven medicines, under the same signs for cold and flu, pain relief, sleep aids, and so on."

"If you search for 'flu treatment' on their website, it even suggests homeopathics to you," said Little. "CVS is making no distinction between those products that have been vetted and tested by science, and those that are nothing but snake oil."

CFI has sued the United States' largest pharmacy chain, CVS Health Corporation, for "a continuing pattern of fraudulent, deceptive, and otherwise improper marketing practices" in its promotion and display of homeopathic remedies.

"CVS is taking cynical advantage of their customers' confusion and trust in the CVS brand, and putting their health at risk to make a profit," added Little. "And they can't claim ignorance. If the people in charge of the country's largest pharmacy don't know that homeopathy is bunk, they should be kept as far away from the American healthcare system as possible."

Robyn Blumner, president and CEO of CFI, said the lawsuit was a final resort. "We made a number of efforts to discuss this situation with CVS, but the concerns we raised were ignored," she said. "Homeopathy is a multibillion-dollar consumer fraud. If CVS would rather line its pockets than protect Americans' health, we have no choice but to take this fight to the courts."

CFI's twenty-eight–page complaint against CVS is clearly stated and strongly worded. "That was very much a conscious choice," Little told SI. "I think in this if we get too caught up in the weeds of legalistic language and behavior we lose our biggest advantage, which is the sheer ridiculous nature of homeopathy."

CFI made these factual allegations, all supported with abundant references to the scientific literature:

- "Homeopathy is a pseudoscience." (This is backed up by numerous references.)
- "Homeopathic products do not work and cannot work." There is no evidence they are any more effective than a placebo.
- CVS Health retails homeopathic products both online and in its 9,800 physical stores.
- CVS Health places homeopathic products alongside science-based, tested medicines.
- CVS's product placement of homeopathic products makes material false and misleading claims regarding their effectiveness.

One example included in the complaint: CVS's "marketing and product placement" indicates to consumers that ibuprofen, listed on the World Health Organization's Model List of Essential Medicines, "is not more effective than the homeopathic remedy displayed beside it, Arnicare Arthritis." By displaying them side by side, "CVS is actively claiming that Arnicare Arthritis provides relief for arthritis pain. Arnicare Arthritis does not provide relief for arthritis pain at any level greater than a placebo."

The suit notes that similar compar-

isons can be made for each homeopathic product sold by CVS.

The suit says CVS knew or should have known that no scientific evidence exists to show that homeopathic remedies have any effect on specific diseases. It says CVS knew or should have known that its product placement and labeling create confusion between homeopathic remedies and science-based medicines.

CFI has for many years lobbied for tighter regulation of homeopathic products and has been invited by the FDA and FTC to provide expert testimony. As a result, the FTC declared in 2016 that the marketing of homeopathic products for specific diseases and symptoms is only acceptable if consumers are told: "(1) there is no scientific evidence that the product works and (2) the product's claims are based only on theories of homeopathy from the 1700s that are not accepted by most modern medical experts." And last year, the FDA announced a new "risk-based" policy of regulatory action against homeopathic products.

"CVS is taking cynical advantage of their customers' confusion and trust in the CVS brand, and putting their health at risk to make a profit."
— Nicholas Little, CFI vice president and general counsel

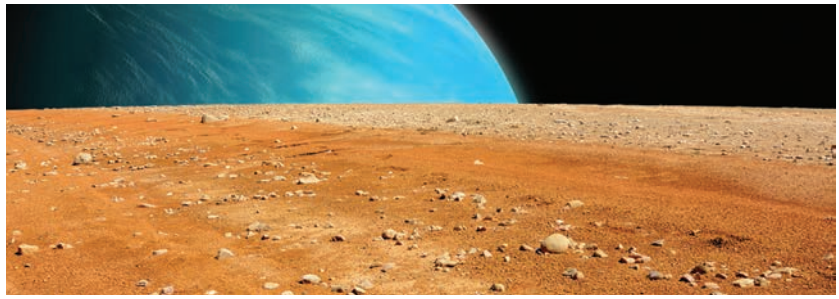
"CVS should be warned, the evidence for our case is extremely strong," said Blumner. "And if CVS's endorsement of homeopathy is any indication, evidence will not be their strong suit." CFI and CVS's lawyers and management are now in discussions about the suit.

The lawsuit document and CFI's July 9, 2018, news release announcing the suit are on CFI's website, centerforinquiry.org.

Kendrick Frazier is editor of the Skeptical Inquirer.

Fear of Aliens: How to Protect Alien Microbes (and Us)

David Morrison



NASA is concerned about aliens. No, not undocumented immigrants or the scary space invaders loved by Hollywood. The real science questions are related to the search for microbial life in our solar system: on Mars, Europa, Titan, or Enceladus. Each of these has a possibility of supporting life: Mars has a geological and climate history most like Earth; Europa and Enceladus both have extensive oceans of warm liquid water under an ice crust; and Titan has a complex organic chemistry but is too cold for liquid water.

If life exists on any of these worlds, it is likely to have begun there, providing evidence of a second (or third or fourth) genesis within our solar system. Finding any lifeforms, or even life precursors or fossils, would be tremendously exciting to scientists and the public alike.

Mars's habitability is a central focus of today's missions to the Red Planet, and the results encourage us to move on to a search for life itself. Robotic landers planned for the 2020s may carry the first life-detection experiments since the Viking mission in 1976, or alternatively include the return of samples from Mars to be analyzed in terrestrial laboratories. The discipline called "planetary protection" establishes guidelines to minimize biological cross-contamination between worlds. We think we know how to handle these issues, although assuring the public that our protocols are safe may be a challenge. But now there is also serious discussion of landing humans on Mars. This would introduce a new set of concerns, since surely any humans who land on Mars would want to return eventually to Earth, and there is no way to sterilize humans or their hardware. By landing there, the astronauts might compromise our hope of ever finding indigenous martian life.

Mars missions today follow international planetary protection agreements to minimize the possibility of the transfer of biota between Mars and Earth that might harm any indigenous life on either world. Hardware landed on Mars is decontaminated and may be sterilized to minimize forward contamination. Alternatively, the missions land in places that are considered inhospitable to terrestrial microorganisms. In fact, it seems unlikely that the martian *surface* would be able to support any organisms from Earth, due to its extreme dry cold and a lethal dose of ultraviolet light from the Sun. Life might exist below the surface or in protected environments such as lava caves, however, and some of these environments might not be lethal to microbial invaders from our planet.

NASA is concerned about aliens. No, not undocumented immigrants or the scary space invaders loved by Hollywood.

Return of Mars samples to Earth raises another worry: that our planet might be contaminated. This seems unlikely because any life that survives on Mars is adapted to conditions very

different from Earth and may have alien chemical or genetic structure. Furthermore, meteor impacts occasionally eject rock fragments from Mars that can reach Earth. We have found numerous Mars meteorites, which are of great value to scientists. As far as we know these meteorites do not carry dangerous microbes; if they did, our planet would likely have been contaminated many times over its history by this natural process.

A new report from the National Academy of Sciences issued in July 2018 urges NASA to create a broad planetary protection strategic plan. This plan should include how to handle returned samples and how to avoid contamination when human missions are sent to Mars. The Academy also expresses concern about private industry missions to Mars, since there is no agency with the authority to regulate space exploration by non-government entities. The report concludes: "Soundly framed and executed planetary protection policies will play a critical role in ensuring that space exploration efforts will deliver unambiguous answers to the possibility of life elsewhere in the solar system."

The challenge is daunting. How can we search for life without simultaneously contaminating Mars? One approach would be to keep humans away from any places on Mars that might harbor indigenous life, confining them to teleoperations from Mars's moon Phobus, for example, or from surface sites that have been certified sterile. But would astronauts be willing to travel all the way to Mars and then be denied the opportunity to study interesting parts of the planet in person? There is also the philosophical question of who will advocate for possible Mars life, even microbial life, as opposed to opening the entire planet to human exploration and ultimately perhaps exploitation.

H.G. Wells anticipated some of these issues in his classic 1898 novel *War of the Worlds*. In this story, the invaders from Mars have superior technology but ultimately succumb to terrestrial biota. What if it had been the other way around? In that case I suppose Wells would have lost his readership.

Copies of the Academy's *Review and Assessment of Planetary Protection Policy Development Processes* are available at www.nap.edu.

David Morrison is a NASA senior scientist and an SI contributing editor. He is a founder of the discipline of astrobiology.

New York Times Again Hypes Saucers

Joe Nickell and James McGaha

Having last year waded into a topic that reporters seem perpetually ill-equipped to handle—unidentified flying objects—*The New York Times* has done it again. In the August 3, 2018, edition, reporter Laura M. Holson revisited the July 1952 "invasion of Washington" flap with the obvious intention of peddling a mystery, along with selling newspapers. The *Times* checked in with pro-UFO groups and cautious government sources, while largely ignoring science-based UFO investigators.

The 1952 Washington, D.C., light show was the main event in what is now known as the Great UFO Flap of that year. It was a time when the public's attention was increasingly drawn to the skies, and science fiction had popularized the notion of extraterrestrial visitations.

The Times checked in with pro-UFO groups and cautious government sources, while largely ignoring science-based UFO investigators.

The first of two series of sightings took place in the area during July 19–20. It began before midnight on July 19 when Air Route Traffic Control (ARTC) at Washington National Airport observed seven radar targets—first on their long-range radar, then confirmed by short-range radar. Andrews Air Force Base was notified, and an airman called in to report having seen several bright objects. A tower operator stated he saw a fiery object with a tail. Then, over the course of several minutes, an airline pilot observed six lights—some moving fast, others hovering. Another pilot reported a light seeming to follow his plane. A second wave of sightings occurred July 26–27.

Generally, the lights were described as "completely radical compared to those of ordinary aircraft." They sometimes hovered and even darted up and down—as if they were some type of illusion. Indeed, an Air Force captain on the ground who had observed a light changing color and seeming to float and dip went outside to look again at the light and determined he was only looking at a star and the illusory effects of scintillation. A tower operator referred to the "power of suggestion" that could animate a star or turn meteors into alien spaceships (see Curtis Peebles, *Watch the Skies*, 1995, 68–80), and the events in question occurred during the annual Perseids meteor shower (July 17 to August 24).

Three radar sites (National Airport, Andrews Air Force Base, and Bolling Air Force Base across the Potomac) overlapped with their radar coverage, but only *once* did all three radars pick up the same target in the overlap area, which lasted just thirty seconds. A subsequent Air Force investigation of the incidents attributed many of the radar echoes to weather: turbulent air and temperature inversions (involving a layer of cool, dry air surmounted by a warm, humid one, that can cause radar signals to strike the ground and thus be reflected back). A later government study of unknown radar targets during a three-month period revealed that "a temperature inversion had been indicated in almost every instance when the unidentified radar targets or visual objects had been reported" (quoted in Peebles 1995, 79). Despite claims to the contrary, radar could not distinguish between a real target and a mirage (or "ghost") image. (See also Ronald D. Story, ed., *The Encyclopedia of Extraterrestrial Encounters,* 2001, 644–645.)

To label the Washington case as *unexplained* is really to ignore the preponderance of evidence. The flap was obviously caused by the lights of bright meteors and stars and, on the radar, by temperature-inversion false images. Reporter Holson happily concludes, "And so the mystery continues," engaging in the logical fallacy known as an argument from ignorance: that the lack of an utterly conclusive explanation implies the "objects" were flying saucers. Actually, that is the least likely explanation.

Joe Nickell, PhD, is CSI's senior research fellow and author of numerous investigative books. James McGaha (Major, USAF ret.) is a former special operations pilot and director of the Grasslands Observatory, Tucson, Arizona.

Why We're Susceptible to Fake News—and How to Defend against It

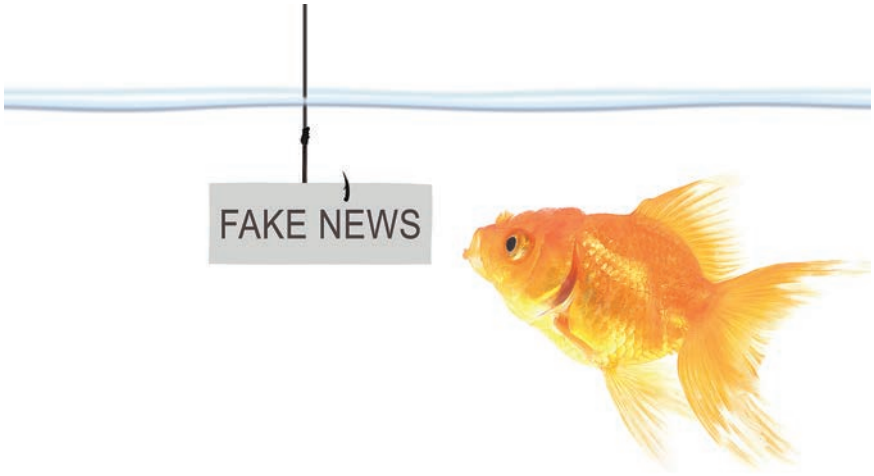
Thought processes and belief systems that people develop early in life to help protect against the anxiety and stress of an uncertain world may help explain why some individuals fall victim to what has come to be known as fake news, but psychologists can offer some strategies to defend against it, according to a series of presentations at the annual convention of the American Psychological Association in August 2018 in San Francisco.

"At its core is the need for the brain to receive confirming information that harmonizes with an individual's existing views and beliefs," said Mark Whitmore, PhD, assistant professor of management and information systems at Kent State University's College of Business Administration. "In fact, one could say the brain is hardwired to accept, reject, misremember, or distort information based on whether it is viewed as accepting of, or threatening to, existing beliefs."

Thinking developed in childhood makes people vulnerable, researchers say.

The key to people's accepting fake news as true, despite evidence to the contrary, is a phenomenon known as *confirmation bias*, or the tendency for people to seek and accept information that confirms their existing beliefs while rejecting or ignoring that which contradicts those beliefs, he said.

Many of these beliefs and biases are formed early in life when children begin to distinguish between fantasy and reality, according to Eve Whitmore, PhD, a developmental psychologist with Western Reserve Psychological Associates in Stow, Ohio, who also presented at the session. Some of these beliefs can be based in fantasy, and that can lead to what she calls nonsensical thinking.



"From the beginning, parents reinforce to their children the skill of pretending in order to cope with the realities inherent in culture and society," she said. "Children's learning about make-believe and mastery of it becomes the basis for more complex forms of self-deception and illusion into adulthood."

Parents commonly encourage young children to engage in pretend play. Through this pretend play, children often practice little life scenarios, like playing house, that help to reinforce cultural norms and beliefs and aid in assimilation as they age. The flip side is that children also learn that sometimes it's okay to make believe things are true, even though they know they are not, according to Eve Whitmore.

In adolescence, people develop critical thinking skills and some begin to question what they were taught as children, perhaps religious beliefs or even the belief that authority figures such as parents or even the government leaders are always right. But going against one's parents' beliefs can cause friction within the family, and, despite evidence to the contrary, some are willing to rationalize those false beliefs in order to avoid upsetting their parents, she said.

It may begin as a conscious decision, but as rationalization piles on top of rationalization over the years, these processes can become unconscious. As people reach adulthood many of these false beliefs and biases formed as children, instead of being given a good critical examination, are simply accepted and continue to influence how a person perceives his or her world, according to Mark Whitmore.

Parents commonly encourage young children to engage in pretend play. This pretend play helps to reinforce cultural norms and beliefs and aid in assimilation as they age.

"In this way, childhood beliefs persevere throughout a person's life and serve as a framework for processing information in adulthood," he said. "In attempting to confirm preconceived ideas, a person may resort to both fiction and reality in order to preserve these beliefs."

The rise of the internet and social media has only compounded the problem of fake news, according to Mark Whitmore, upending the traditional news model where an individual receives from a small number of outlets.

"In today's media environment, the channels are multiple, and the messages are often simultaneous and contradictory," he said. "The receiver is often faced with paradoxical and seemingly absurd messages. It becomes easier to cling to a simple fiction than a complicated reality."

Psychology offers a few evidence-based strategies for defending against the pull of fake news, according to Whitmore. One key to avoiding the pull of confirmation bias is reducing the anxiety that makes it so appealing.

"One positive defense strategy is humor. Watching late night comedy or political satire, while not actually altering or changing the source of the stressor, can help reduce the stress and anxiety associated with it," he said. "Another is sublimation, where you channel your negative feelings into something positive, such as running for office, marching in a protest or volunteering for a social cause."

He also recommends that people cultivate an open mind by deliberately exposing themselves to different points of view. This can help them moderate their viewpoints and make them less extreme, he said.

Critical thinking is also key. People must learn to question what they are told and this should begin in childhood, said Whitmore.

"Developing a greater degree of skepticism in children, by encouraging them to ask why and to question, diminishes confirmation bias," he said. "All of these strategies have substantial research supporting their beneficial effects."

This symposium report was prepared and issued by the American Psychological Association, the largest scientific and professional organization representing psychology in the United States.

A Year Later, History Channel Mystery Remains

Benjamin Radford

Over a year has passed since The History Channel suffered one of the highest-profile blows to its credibility in, well, the history of the channel.

On July 9, 2017, History premiered an "investigative special" titled *Amelia Earhart: The Lost Evidence*, which claimed to have discovered—after an exhaustive search by a team of world-class researchers, including retired federal agent Les Kinney and forensic analysts Kent Gibson and Doug Carner—photographic evidence that Amelia Earhart and her navigator Fred Noonan survived their 1937 disappearance and were rescued by the Japanese military in the Marshall Islands. An ambiguous, poor-quality "smoking gun" photo was claimed to show both aviators on a dock and the wreckage of their plane in the background.

Doubts were raised before the show aired and quickly escalated afterward. The photograph, as it turns out, was published in a 1935 Japanese-language travelogue about islands of the South Pacific. Japanese blogger Kota Yamano found the book in less than an hour after searching Japan's national library using the term *Jaluit Atoll*, the location featured in the photograph. Displaying keen investigative acumen, Yamano said in an interview "I find it strange that the documentary makers didn't confirm the date of the photograph or the publication in which it originally appeared. That's the first thing they should have done."

In the wake of the devastating debunking, requests for additional clarification were not returned. In a July 11, 2017, statement, the History Channel said that it has a team of investigators "exploring the latest developments about Amelia Earhart" and promised transparency in their findings, concluding that "Ultimately historical accuracy is most important to us and our viewers." No winking smiley face icon followed, which suggests that the comment was not intended ironically.

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Ultimately historical accuracy is most important to us and our viewers. (2/2)

Over a year has now passed, and apparently the History Channel's crack team of investigators still hasn't been able to figure out how exactly their research and program went so spectacularly off the rails into baseless conspiracy theory and pseudoscience. If they'd like some help, they can read my analysis of the fiasco (that appeared both online and in the November/December 2017 issue of this magazine)—or maybe they should just hire Yamano for an hour's work. The History Channel did not respond to a request for an update on its flawed research into the photo's provenance.

Benjamin Radford is the deputy editor of the Skeptical Inquirer.

'I Was There …': Harlan Ellison Witnesses the Birth of Scientology

James Underdown

The prolific and iconoclastic writer Harlan Ellison died June 27, 2018, at his home in Sherman Oaks, California, at the age of eighty-four. Preferring the term speculative fiction *to* science fiction*, Ellison wrote more than 1,500 short stories (such as "I Have No Mouth, and I Must Scream"), essays, and reviews. He also wrote film and television scripts, including several* Star Trek *episodes. He was a natural-born skeptic and participated in a variety of events sponsored by the Committee for Skeptical Inquiry over the years, including a luncheon talk at CSICOP's Fourth World Skeptics Conference in Burbank in 2002 that ranged widely and irreverently over religion, politics, and science. At that same conference, he was awarded CSICOP's Distinguished Skeptic Award (see SI, "The Inimitable Harlan Ellison," September/October 2002). He also wrote the lead tribute to science fiction great Arthur C. Clarke ("Arthur 'N' Me") in our July/August 2008 issue. Here is a brief reminiscence by James Underdown, executive director of CFI West in Los Angeles.* —Kendrick Frazier, Editor

In 2014, I had a long phone conversation with Harlan Ellison during which I took many notes. I had sent Harlan a letter asking if he'd appear in (or at least consult on) a music video my band, The Heathens, was considering shooting. Craig Else and I had written a song about L. Ron Hubbard and thought it would be fun to have Harlan be a part of it somehow.

Harlan was not interested in being a part of the video because he had concerns for himself and his wife that there may be retribution from the Church of Scientology and because he preferred to leave the criticisms of the church and its leadership to others.

During the conversation, however, he set the record straight about the night he personally witnessed a seed being planted that would eventually grow into the Church of Scientology.

The year was 1953 or 1954, and a not-yet-twenty-year-old Harlan Ellison had come to New York City from Ohio to meet Algis Budrys and other members of the Hydra Club, a social organization of science fiction professionals and fans. It was at a gathering of the Hydra Club at L. Jerome Stanton's apartment where Harlan found himself in the company of some of the elite science fiction writers of the time—of all time, really.

Present were Budrys, Arthur C. Clarke (visiting from England), Lester del Rey, Fletcher Pratt, L. Sprague de Camp, Isaac Asimov, and L. Ron Hubbard. Harlan described Hubbard as "a liar from birth who never told the truth about himself that was not bloviated, exaggerated, over filigreed … ."

It was surprising to me to hear that Harlan also seemed to hold some professional admiration for Hubbard, despite his obvious disdain for him as a person. He mentioned Hubbard's ability to crank out prodigious amounts of material—not all of which was hack. He called Hubbard's books *Final Blackout* and *Slaves of Sleep* "fucking brilliant." And he acknowledged Hubbard's space adventure stories, written under the name René Lafayette, some of which years later would be incorporated into Scientology's wild backstory.

At some point that night, L. Ron Hubbard, who was making considerably more than the penny-a-word that most of the others were making, got up and said that he couldn't make a living getting paid those wages. He couldn't make ends meet. (Harlan agreed that science fiction writers were treated poorly and saw unsavory publishers ripping off writers during his whole career.) So Lester del Rey, a science fiction author who as a child had been a tent-revival minister (and knew how religion could be used to fleece people), said, "Ron, if you want to get rich, what you gotta do is start a religion."

Harlan made it clear that other writers have told him about similar exchanges occurring at different times and places involving people telling Hubbard he ought to start a religion. This was the time *Harlan* saw it firsthand.

Hubbard wrote, and made a lot of money from, his book *Dianetics* before creating Scientology. Some have argued that Hubbard saw franchising Scientology as a better way to control income and content than writing a book that is released everywhere. Nevertheless, Harlan Ellison had to be one of the last living eyewitnesses to see that seed planted into the mind of L. Ron Hubbard, prolific creator of fiction.

I'll miss his brutal frankness and indomitable spirit. (Harlan's, I mean.) ■

James Underdown is the executive director of the Center for Inquiry West in Los Angeles and founder and chair of the Independent Investigations Group.

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Essential Oils: One Weird Workshop

SUSAN GOULD

Continuing education is part of most professional jobs. Having been a social worker for twenty years and an elementary education teacher for the past sixteen years, I have experienced ongoing training throughout my professional careers. However, nothing prepared me for the workshops my colleagues and I were required to attend this past winter. This continuing education day was billed as a "health day" and was different from any other of the professional workshops I have attended.

My colleagues and I were given many options to choose from, including courses on topics such as self-defense, cooking in healthy ways, mindfulness, and essential oils. Having been a skeptic my entire life, one of the courses I knew I had to sign up for was essential oils. I am constantly hearing about people who claim that essential oils have changed their lives, cured many ailments, and provided overall physical and mental happiness. I wanted to experience what all this buzz was about.

In conducting some research in the days before the workshop, I found that aromatherapy and essential oils can be defined as using plant life to improve well-being. These two terms are sometimes used interchangeably, and I found this a rather vague definition, so I decided to hold back the rest of my research until after the class.

Given my curious nature and my scientific aptitude to not accept things at face value, I began asking Anne questions—starting with scientific research and where to find it.

Upon entering the classroom where the course was taking place, I couldn't help but notice the softly lit diffuser in the back of the room. The instructor, "Anne," identified this as an "immunity booster" combination of oils. She explained that she chose this due to the enormous number of germs found in schools during the winter months.

Anne introduced herself to the crowded all-woman class, explaining how she began her career as an aroma therapist by making lip balm and soap. She described how soaps sold commercially in stores contain bar detergent—which, apparently, is not a good thing—adding how all her soaps are vegan and contain essential oils. She went on to describe the many uses she found for essential oils, including anti-itch creams and teething remedies.

Anne also distributed a handout that included many more uses for her essential oils. The top eight claimed to help with ailments such as insomnia, pain, acne, migraines, depression, and nausea, to name a few—as well as help with cold and flu prevention.

In a *Time* magazine article (Heid 2016), Dr. Edzard Ernst, a former chair of complementary medicine at the

University of Exeter in the U.K. (and a frequent contributor to Skeptical Inquirer), said that he found no "convincing" evidence that aromatherapy does any good when it comes to calming hypertension, depression, anxiety, pain, and symptoms of dementia. "Aroma therapists claim that specific oils have specific health effects," Ernst said. "This, in my view, is little more than wishful thinking." Ernst has published two review studies that closely examined the health effects of aromatherapy (Ernst and Cooke 2000; Ernst et al. 2012).

Given my curious nature and my scientific aptitude to not accept things at face value, I began asking Anne questions—starting with scientific research and where to find it. Anne responded that she "didn't know of any" and could not answer my question. Obviously sensing my immediate skepticism, she followed up by saying, "There are two sides to everything."

Anne continued her presentation by discussing the various companies that sell essential oils, including how they are sold and what she prefers to buy and use. One of these companies is doTERRA. In an entry titled "The Controversy and Hypocrisy Surrounding Essential Oils," blogger Jessie Reimers, who describes herself as a doTERRA "Wellness Advocate," states:

> It is about taking a proactive role in our health and that of our families. It's about getting rid of toxic, endocrine disrupting, health damaging household chemicals and cosmetics, cleaning with something pure and natural, supporting ourselves on a physical, cellular, and emotional manner to assist the body in doing what it does best, maintaining homeostasis. … I think we all really need to calm down, look at the situation sensibly, and work together to have as many options as possible available to people. (Reimers 2015)

This sounds good at the outset but relates to another question that was asked in the workshop. A colleague of mine asked, "Why are people suspicious of these pure things but will buy medicines from the store?" I couldn't help but respond to that question with "Because the medicines from the store have gone through scientific studies with results that have been replicated over and over again. This has not." Sadly enough, there were no other responses either supporting or denying my answer, and the instructor continued with her presentation of the various concoctions she uses to treat a menu of ailments.

It was surprising to me that so many well-educated attendees seemed to accept the remedies at face value; many even bought numerous products at the end of the session. Several people chimed in with anecdotal evidence about their own positive experiences using essential oils.

What came to my mind while listening to these comments is well-stated in the *Time* magazine article: "If you believe sniffing rosemary or eucalyptus is going to perk you up or mellow you out, your expectations can result in placebo benefits that stem from your brain—not the plant essences you're inhaling. These variables are common in aromatherapy studies."

Going back to my initial definition of aromatherapy, I found much of the advice given about its uses as vague as its definition. My presenter continuously made comments such as: "It could work one day and not work the next day." "It's all individual." "It depends what you're using them for." "As an individual, you have to know what works best for you." "Not everyone is a believer." And my favorite, quoted by both my presenter and Jessie Reimers, the wellness advocate: "… never claim to cure, diagnose, treat, or prevent any specific condition." Then why was I sitting here for two hours listening to a presentation about the uses of essential oils suggesting that they cure, diagnose, treat, or prevent specific conditions?

It was surprising to me that so many well-educated attendees seemed to accept the remedies at face value. Several people chimed in with anecdotal evidence about their own positive experiences using essential oils.

Although I found the presentation quite entertaining, there appeared to be absolutely no solid scientific evidence for spending money and using these products. I guess it's hard to resist when you are told that you are "investing in your health." I would rather save my money and wait until actual useful evidence is found. To quote the *Time* magazine article, "… it's safe to say the science on aromatherapy's health perks is, at best, inconclusive." ■

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Susan Gould is a licensed clinical social worker and an elementary school teacher in New Jersey. She is interested in increasing awareness about the dangers of pseudoscience.

The Salton Sea Flat Earth Test

When Skeptics Meet Deniers

JAMES UNDERDOWN

Back in the 1970s when organized science-based skepticism was just getting on its feet, someone such as The Amazing Randi or Joe Nickell could just investigate and solve mysteries such as spoon bending, Bigfoot, crop circles, or the Roswell crash and share the information in Skeptical Inquirer magazine or with Johnny Carson. With a little care and attention, most wacky claims were debunked and the conclusions disseminated.

Today, skeptics fight not only false assertions and misinterpretation of facts but also a fundamental distrust of science and a deep-seated paranoia about reputable institutions lying to the entire culture. As formidable as these issues are alone, they become exponentially worse because the spreaders of all this bad information have at their fingertips massive reach. Such is the case with flat earthers.

On Sunday, June 10, 2018, about a dozen pro-science skeptics from the Independent Investigations Group (IIG) at the Center for Inquiry West in Los Angeles met a similar-sized group of flat earthers to demonstrate the curvature of the earth across the Salton Sea, a troubled body of salty water 160 miles southeast of Los Angeles, whose water level is going down and salinity is going up. There is also toxic dust from nearby agriculture that is polluting the air in the area. National Geographic Explorer was there to video the encounter.

Today, skeptics fight not only false assertions and misinterpretation of facts but also a fundamental distrust of science and a deep-seated paranoia about reputable institutions lying to the entire culture.

Though flat-earther models vary significantly, many believe water, like the rest of the planet, is flat. Assuming clear enough air and a powerful enough telescope, they believe a person standing near the water on one shore can see someone standing on another shore miles away. In fact, Earth's curve makes an average-height person disappear below the horizon to a similar-sized person at a distance of about six miles.

We decided to conduct this demonstration of a well-known fact for three reasons. First, as science-based skeptics we think it's okay to question any proposition with sound inquiry, and we're keen to hear which twisted denials the "high ranking" flat earthers who attended would proffer after they saw the curve for themselves. My eighteen years of experience with testing extraordinary claims has exposed me to a mountain of lame excuses. What would these be?

Second, we were kind of excited to see the curvature ourselves. Most people know Earth is a sphere but don't get to witness the evidence so beautifully through telescopes across bodies of water.

Third, we wanted to address this rampant *denier* culture face to face. Skeptics use science to look into all sorts of wild claims but are willing to adjust their thinking when presented

with strong evidence. Deniers refuse to accept conclusions even when there is overwhelming evidence and scientific consensus.

Predictably, the demonstration went about as the science said it should. Our shore-to-shore, balloon-raised target couldn't be seen from 9.6 miles until it was some forty-five feet in the air. The 9'x 6' boat-based target lost most of one of its (one-foot-wide) horizontal stripes at three miles away from shore.

The flat-earth backpedaling to this confirmation was both immediate and fervent. The mental gymnastics ranged from "what we just saw didn't happen like that" to citing non-Earth-curve-related optical effects that obscured the targets. They denied the validity of the whole demonstration, though only after it went against them. The post-demo face-off quickly devolved into tangents about the alleged "moon hoax," NASA cover-ups, and why us "globers" can't see how we're being played by various powerful and secretive institutions.

Therein lies one of the differences between today's crackpots and the bizarre claims of the past. The flat earthers, the 9/11 "truthers," the moon hoax advocates, chemtrail advocates, and any number of fringe groups believe in ideas that require *massive conspiratorial cover-ups* to hold together. They think powerful cabals are in charge of covering up bomb evidence at the World Trade Center, suppressing information about alien landings, and countless other schemes. The flat earthers bristled when I called them conspiracy theorists, then trumpeted the idea that higher-ups at NASA had PhotoShopped all the round Earth photos from space.

Skeptics use science to look into all sorts of wild claims but are willing to adjust their thinking when presented with strong evidence. Deniers refuse to accept conclusions even when there is overwhelming evidence and scientific consensus.

This rife, tinfoil-hat paranoia about the dishonesty of various institutions has also led deniers to believe that average people have the intellectual chops to assess complex scientific ideas. It takes only a paper-thin YouTube challenge or a half-baked website to undo 400 years of science. They simply do not recognize scientific methods and expertise and are quite content to assemble their view of reality from internet hearsay. One flat earther thought peer review could be done by *anyone*. Another trusts no scientific theory whatsoever because it's "only a theory."

This casual dismissal of scientific achievement is more than just wrong. It's dangerous. Our species doesn't make significant advances through popular opinion and webcasts. It makes them through hard work and the acquisition of expertise.

There was a certain irony to many flat earthers using some form of GPS and highly engineered automobiles to get to the Salton Sea. They admit to owning computers and rely on modern, science-based medicine in emergencies but see no contradiction between their everyday implicit faith in science and what that same science says about the shape of Earth.

Belief in a flat Earth may sound like a joke, but the proponents aren't kidding. They are using science-based technology on a scientifically challenged populace to add to their credulous legions. Decades ago, the members of the lunatic fringe had trouble finding each other. Today, they grow. ■

James Underdown is the executive director of the Center for Inquiry West in Los Angeles and the chair and founder of the Independent Investigations Group.

Thoughts on Visiting Darwin's Home, Down House

KENDRICK FRAZIER

I am always interested in seeing how countries and cultures honor their scientists, thinkers, and innovators. Today, entertainers and athletes get the bulk of popular acclaim. I don't begrudge their fame—it is well deserved—but it is always nice to see when people who have advanced our understanding of the world in profound ways get their due. On a trip to Britain in August, I finally got to realize a lifelong dream and visit the home where Charles Darwin lived and worked the last forty years of his life (1842–1882), Down House. In a secluded rural area of Kent, southeast of London, it is where he researched and wrote *On the Origin of Species*. It is where he carried out studies and observations that led not only to his theory of evolution by natural selection (codiscovered independently by Alfred Russell Wallace) which he published in 1859 but to an amazing variety of other groundbreaking papers and books (he was the world's expert on barnacles; he loved and studied worms; he measured plant movements; he was an astute geologist) that have made Darwin one of the preeminent scientific figures of all time.

Down House is not really on the tourist track. I'd hoped we could find a small bus or van tour out of London. As far as I could learn, such doesn't exist. You need to get there on your own, though that is fairly easy. Take the train from London's Charing Cross Station southeast for nine stops (about half an hour) to Orpington Station, then take a taxi 3.9 miles to Down House (or train from Victoria Station to Bromley, and then a slightly longer taxi ride). Once there, they are all set up for visitors. This is courtesy of the nonprofit group English Heritage and its capable staff and volunteers, who operate the house and property admirably. You can have a delightful day.

Your editor displaying the September/October 2018 Skeptical Inquirer outside Darwin's home, Down House. Credit: Ruth Frazier

You are in Darwin's study, a large, warm room filled with his own furniture and personal and scientific items. You can see his scientific instruments, specimen bottles, books, and writing board. It's where he wrote his books and carried out his voluminous correspondence with scientific colleagues worldwide. You can visit his bedroom, the dining room, and the various family rooms. And what a family it was! Charles and Emma Wedgewood Darwin had ten children. Three died very young, but five boys and two girls survived and flourished there with them. In contrast to prevailing Victorian standards, both parents openly loved and respected their children, played with them, and encouraged them to play and express themselves. The house feels lived in. It must have been a warm and raucous place, one that nevertheless provided Darwin with the solitude and supportive setting he needed to think, study, and write. Emma oversaw the whole family operation and cared for Charles when he was ill.

And then there are the grounds. A huge grass backyard, bordered by trees and ornamented with flowers, beautifully frames the home. My wife and I sauntered out through it, enjoying the cool afternoon, and then eventually discovered—on our own, out beyond those grounds—Darwin's greenhouse, innovative for its time. In three sections,

it is filled with orchids and carnivorous plants, and it is where he observed and meticulously studied plant movements, plant behavior, growth patterns, reproductive behavior, and pollination (a tunnel passageway allows bees to fly in and out). The grounds go on and on. There are huge flower and vegetable gardens that again served Darwin's biological studies. Off through a stone wall and archway to the right, there's another yard where the children played and an early not-quite-yet rectangular tennis court. And off in another direction there's his Sandwalk, "ominous and solitary" in his daughter Gwen's description, where he strolled three times a day to think and develop his ideas.

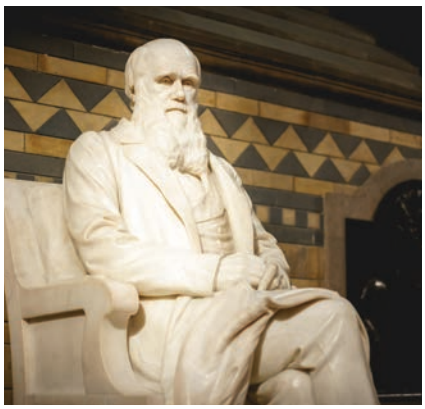
The feeling is almost as though you are there at the time, observing the great observer at work and at play. If the five-year voyage of the *Beagle* was Darwin's epic field trip (and it certainly was), Down House served as his own at-home laboratory for his subsequent systematic experiments and observations.

England has done an admirable job with Down House. Darwin's legacy there is kept alive and well. And not just there; until just earlier this year, Darwin and his theory of evolution were colorfully depicted on the Bank of England's E-Series £10 note. (Darwin is now replaced by the novelist Jane Austen.)

Likewise, when I visited London's great Natural History Museum, in South Kensington, I was pleasantly surprised to see atop the steps at the far end of the vast building-long entrance hall a huge marble statue of a kindly Darwin, seated and looking genial, welcoming visitors. It was moved to this prime position in the museum's central hall in 2008, in observance of the February 2009 bicentenary of Darwin's birth. (That's why I didn't remember it from my previous visit to the museum years earlier.) I watched for a long time as family after family came up to it, touched it, and had their photos taken with Darwin. I'd like to think that the same thing could happen in my own country, the United States: a modern scientific powerhouse where nevertheless the antievolution movement (creationism) based on biblical literalism still has enormous political and social influence. I'd like to think so, but I can't be sure.

Nearby is a statue of biologist Thomas H. Huxley, "Darwin's bulldog," who so effectively spoke out on behalf of Darwin's then-novel theory.

These kinds of tangible representations of great scientific figures may be imperfect in a strictly educational sense, but I find them important. They tell us what a civilization values. They tell us



what it celebrates. Later, in Edinburgh, I visited the statue of the great Enlightenment philosopher David Hume. If scientific skeptics had patron saints, he would be one of them. It's right there on High Street, the Royal Mile, on a busy sidewalk in the very center of Edinburgh. Tourists walk by and rub his toe. After posting on Facebook a photo of my wife and me visiting it, an SI reader brought to my attention a newly written essay praising Hume by the philosopher Julian Baggini, "Hume the Humane," describing why Hume is "the amiable, modest, generous philosopher we need now." It is a lively, enjoyable read, and I urge you to seek it out online and see why we all still value him so highly.

Last year in old Prague, I came across a wall plaque and a tiny museum honoring the early astronomers Tycho Brahe and Johann Kepler, who lived and worked there. In Budapest, a proud tour guide pointed out a plaque honoring the Hungarian-born pioneer nuclear physicists Edward Teller, Eugene Wigner, and Leo Szilard. On a walk a few years back to the old campus of the University of Copenhagen, I came across exactly what I hoped might be outside a classroom building: a statue of Niels Bohr, the physicist who explained the internal structure of the atom. On the Eiffel Tower in Paris, if you look closely at a crossbeam high in the air, you'll find engraved the names of dozens of famous French scientists and engineers. In China, in 2007, Paul Kurtz and I visited the China Science and Technology Museum in Beijing, and I marveled at a two-hallway-long display depicting full-size images of every single member of the Chinese Academy of Sciences.

Early in my career I worked at the U.S. National Academy of Sciences in Washington, D.C. Sometime after I left (in April 1979 to be exact, the centennial of Einstein's birth), the Academy erected on the southwest corner of their headquarters property at 21st Street and Constitution Avenue NW a monumental four-ton, twelve-foot-high bronze statue of Einstein in casual repose. In Einstein's left hand are engraved three equations summarizing three of his key scientific advances—general relativity, the photoelectric effect, and energy-mass equivalence. When our first two grandchildren were young, we took them there, and they immediately scrambled high up onto the statue in childlike delight. We were embarrassed at the time, but thinking back on that moment now, I don't think Einstein would have minded.

We need these reminders of great people who have shaped our view of nature and the world. We need to celebrate them, honor them, and treasure their insights and intellectual courage. We need that, for ourselves and for our own sense of the history of ideas and of accomplishment. It is a connection both to our past and to our future. ■

Kendrick Frazier is editor of the SKEPTICAL INQUIRER.

Joe Nickell, PhD, is CSI's senior research fellow. For nearly fifty years, he has provided probable solutions to the world's strange mysteries.

Arkansas's White River Monster: Very Real, but What Was It?

Arkansas's White River holds claim to a "monster" that has been said to have appeared intermittently for a century or more. Its reality is defended by cryptozoologists and skeptics alike (I am both), but what *is* the huge aquatic creature that has proven so elusive? The late cryptozoologist Roy Mackal (1980) thought he knew, but there were problems with his theory. Can we finally solve the mystery?

Monster and Lair

Sightings have been claimed from 1912 and 1917, among other years, but it was July 1937 that confirmed the existence of a great river creature—albeit one that is variously described. At some point, named for its lair, it was dubbed "Whitey," although almost everyone agreed its color was gray. Some added that its skin was "crusty" or "peeling."

Its size was not so certain, with estimates ranging from at least twelve feet to sixty-five feet or more—although Mackal wisely cautioned (1980, 205):

> I ask the reader to take my word for the observation that untrained observers estimating size of unknown objects in water range from exactly right to threefold or fivefold too great. This is especially true when the observer has no object of known size with which to make a comparison. It is generally not appreciated to what extent we rely on comparison to make size estimates.

The creature's weight was also variable—1,000 pounds or more. Although the head was almost never seen, one eyewitness reported glimpsing it and thought it had a protruding horn (Mackal 1980, 207; Cox 2011).

The 1937 sightings placed the creature at a portion of the White River—a major tributary of the Mississippi—just below the city of Newport. A farmer named Bramlett Bateman signed an affidavit as to his observations—which began at about one in the afternoon on July 1 and lasted for five minutes. He subsequently saw it several times over more than two months and believed it to be "about 12 feet long and 4 or 5 feet wide." Three other affidavits were produced—one by a deputy sheriff—and Bateman said he knew of two dozen others who could similarly attest to the unusual creature. Resulting newspaper accounts catapulted the monster of White River "into national prominence" (Mackal 1980, 200).

During the flap, a woman named Ethel Smith of Little Rock stated she had seen the creature thirteen years earlier—i.e., in 1924—while vacationing with her husband and children. Elements of her description tallied with those of others: "It was making a loud blowing noise but never did show its head or tail. It was a terrible-looking thing with dingy gray crusted hide. It frightened me badly." A local fisherman said he had also seen the creature previously at the same site around 1915, and sightings were also reported in 1971 and 1972.[1] As was common, the creature appeared following a widening ring of bubbles and thrashed about for five minutes or more before resubmerging (Mackal 1980, 204). It left in its wake open-mouthed eyewitnesses.

Mackal's Identification

Roy Mackal (1925–2013), a biologist as well as a cryptozoologist, featured the White River Monster in his seminal cryptozoological book, *Searching for Hidden Animals* (1980, 197–208). He brought a great deal of expertise and good sense to the subject.

Mackal was persuaded that those who encountered the White River creature offered useful testimony: "Except for size there is a remarkable consistency among the different witnesses over a long time. There can be no doubt that a real animal or animals had been observed" (Mackal 1980, 205). Mackal collected and summarized the applicable zoological details to produce a sort

of composite picture of the creature, as we have seen.

He concluded:

> The White River case is a clear-cut instance of a known aquatic animal observed outside of its normal habitat or range and therefore unidentified by the observers unfamiliar with the type. The animal in question clearly was a large male elephant seal, either *Mirounga leonina* (southern species) or *Mirounga angustirostris* (northern species).

His identification has convinced many, but there is a serious problem.

Ranging Afar?

The creatures (it's unlikely to be the same individual given such intervals) would have had to enter the river from the Mississippi, and to have connected with it from the Gulf of Mexico. However, it is more than difficult to hypothesize, in the gulf waters, either species of the elephant seal. The Northern species ranges over the Pacific coast of northern Mexico, the United States, and Canada (Whitaker 1996, 742–744), while the Southern elephant seal migrates from Antarctic and sub-Antarctic waters north to Argentina, New Zealand, and South Africa, and even wandering individuals are not found above the equator ("Ocean" 2018).

Another plausible aquatic mammal is the hooded seal. Although it is smaller than the Northern elephant seal (at up to ten feet versus thirteen), it could fit descriptions of "Whitey" pretty well. Although the hooded seal's habitat is the Arctic and North Atlantic, it is very migratory, and individuals have "strayed as far south as Florida" (Whitaker 1996, 739–741). Nevertheless, I am unaware of one ever having reached the Gulf of Mexico, let alone to have then traveled far up the Mississippi and to have done so repeatedly.

One of the seals, the Caribbean or West Indian monk seal, did once populate the very waters of the gulf. Unfortunately, it is now extinct (Whitaker 1996, 741–742).

I believe there is yet another possibility, and it is not only found in the Gulf of Mexico but known to have swum hundreds of miles up the Mississippi!

The Best Suspect

I am referring to the Florida manatee (a subspecies of the West Indian manatee).[2] It is a "massive" aquatic mammal with a minimum length of about thirteen feet (although the largest recorded was fifteen feet). It may weigh as much as about 3,500 pounds. Like the White River monster, it has gray, smooth skin that can appear mottled due to barnacle-like crusts of algae or to common injuries from boat propellers (Whitaker 1996, 807–808; "Florida" 2018; "West Indian" 2018).

The creature appeared following a widening ring of bubbles and thrashed about for five minutes or more before resubmerging. It left in its wake open-mouthed eyewitnesses.

It has no "horn," but whereas Mackal postulated that that once-only descriptor was due to the elephant seal's proboscis (short trunk), I suggest it was one of the manatee's front flipperlike legs, seen beside its head when it rolled over in the water. These appendages have three nails at their end and would seem capable of leaving on shore the fourteen-by-eight-inch, three-toed tracks attributed to the "monster," which also flattened grass and saplings (Mackal 1980, 203, 205, 207). Manatees do crawl onto shores to graze on plants as part of their herbivore lifestyle. And just like the monster, the manatee also makes "blowing" noises ("Manatee" 2014). Again, it basks on the water, rolls, dives, and so on ("West Indian" 2018).

Significantly, the manatee is adapted to both fresh and salt water and so is found in rivers and in the Gulf of Mexico as well as the Atlantic Ocean. It ranges as far west as Texas and as far north as Massachusetts. In fact, in 2006 one traveled some 720 miles up the Mississippi River to enter the Wolf River near Memphis. It was eventually found dead on the banks of McKellar Lake, a slackwater lake south of that city ("Manatee" 2006). That animal's journey shows a manatee to be a very real possibility as the White River creature.

The Memphis manatee died in October and was thought to have succumbed to the cold. However, when a manatee is found north of Florida, it is as "mainly a summer immigrant" (Whitaker 1996, 807). That is consistent with the fact that the White River monster was observed mostly during the summer months: July 1924; June to early September 1937; June, July, and August 1971; and June 1972.

All things considered, the Florida manatee surely represents the preferred hypothesis in the case, which I believe we may now mark closed. ■

Notes

1. One witness in 1971 made a Polaroid snapshot of the supposed creature, which "appeared to have a spiny backbone that stretched for 30 or more feet" (Mackal 1980, 202). In my opinion this looks unnatural and more like a series of dashes made by a retoucher using a pen.

2. I learned a bit about manatees in 2001 when I was in Appalachicola National Forest in the Florida panhandle, which is also supposedly home to a Bigfoot-like creature called the Florida Skunk Ape.

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Matthew Nisbet (@MCNisbet) is professor of communication, public policy, and urban affairs at Northeastern University and a CSI Scientific Consultant. He is editor of the journal *Environmental Communication* and editor-in-chief of *The Oxford Encyclopedia of Climate Change Communication*.

The Ecomodernists

A New Way of Thinking about Climate Change and Human Progress

Scientists expect this year globally to be the fourth-hottest on record, with the only warmer years being the three previous ones. Since 2001, we have lived on a planet that has experienced seventeen of the eighteen hottest years ever observed.

The alarming temperature records set over the past two decades are consistent with a century-long pattern, rigorously confirmed by multiple lines of scientific evidence: the burning of fossil fuels has driven a rise in heat-trapping greenhouse gases (GHG) in the atmosphere, which has already caused nearly a 1 Celsius (C) degree rise in global temperatures.

The impact from destabilizing Earth's climate system are being felt by people living in every country of the world. This summer, record heat in Japan and elsewhere caused dozens of deaths. Firefighters in California struggled to control the largest forest fire on record, one of about twenty that ravaged the state. Forest fires also raged across Canada and even in the Arctic. In Europe, where fires led to deaths in Greece, record-setting heat also severely damaged crops and caused other freakish events. Rivers were so warm in some places that some nuclear reactors had to shut down because the water was too hot to cool them.

"This summer of fire and swelter looks a lot like the future that scientists have been warning about in the era of climate change," wrote Somini Sengupta (2018) in a front-page story in *The New York Times*. "It's revealing in real time how unprepared much of the world remains for life on a hotter planet."

Since 2001, we have lived on a planet that has experienced seventeen of the eighteen hottest years ever observed.

Teasing out the unique role played by human-caused climate change in contributing to extreme weather events (in comparison to natural fluctuations) has long been a scientific challenge. But in recent years research in the area of "attribution science" has developed into a mature field. To date, scientists have published more than 170 reports covering 190 extreme weather events around the world, according to an analysis by the journal *Nature*. About two-thirds of extreme weather events studied were determined by scientists to have been made more likely, or more severe, by human-driven climate change. Heat extremes accounted for 43 percent of these events, followed by droughts (18 percent) and extreme rain or flooding (17 percent) (Schiermeier 2018).

Acknowledging the threats posed by human-caused climate change, in 2015 almost all of the world's countries pledged as part of the United Nations climate treaty to keep global temperature rise this century to lower than 2 degrees C above pre-industrial levels and to strive for a 1.5 degrees C. But to achieve this goal, greenhouse gas emissions would need to be cut by at least 70 percent by 2050 (Tollefson 2018).

As the shift away from fossil fuels to low carbon energy moves at a snail's pace compared to what is needed, in 2017 emissions worldwide rose by nearly 2 percent, the first increase in four years. In an August 2018 lead editorial at *The Economist*, the typically optimistic magazine put the state of progress in the bluntest of terms, running the headline: "The World is Losing the War on Climate Change" ("The World" 2018).

In countries around the world, to replace fossil fuels the massive deployment of solar and wind power will likely need to be supplemented by thousands of advanced nuclear power plants; natural gas plants that capture and bury their emissions; and a gigantically bigger, more powerful, and vastly more complicated energy transmission and storage system. These are just the challenges in decarbonizing the electricity

sector. Equally daunting obstacles exist in the agriculture and transportation sectors (Temple 2018).

As countries struggle to limit their greenhouse gas emissions and decarbonize their economies, there has emerged a space in public life for new ways of thinking about climate change, energy, and politics. In books, essays, and research, a group of intellectuals and scholars calling themselves "ecomodernists" or "ecopragmatists" have put forward a set of ideas that break from conventional thinking, challenging longstanding paradigms about nature, technology, and progress (Fahy and Nisbet 2017; Nisbet 2014).

The Decarbonization Challenge

Most of today's rise in greenhouse gas emissions is driven by energy-hungry Asian nations seeking to rapidly grow their economies and improve the standard of living for billions of people. Between 2006–2016, energy consumption in Asia rose by 40 percent. In India, where emissions are growing the fastest, the country remains highly dependent on coal to produce three-quarters of its electricity. In 2017, the country's use of the world's most polluting fossil fuel grew by 5 percent ("The Year" 2018).

In Germany, even as the country has made unprecedented gains in the deployment of solar and wind power, emissions over the past two years have slightly increased. In 2011, Germany made the rash political decision to phase out its seventeen emissions-free nuclear power plants, which at the time accounted for 25 percent of the country's electricity generation. In doing so, Germany has remained strongly dependent on some of the dirtiest coal power plants in the world for more than 40 percent of its electricity. Efforts to cut emissions have also faltered because of unexpected growth in the economy and lower oil prices, which encouraged greater use of home oil heating and car transportation ("Germany" 2017).

In the United States, the good news is that emissions have declined since their historic peak in 2007, though they still remain above 1990 levels, according to official government estimates. The decline has been driven primarily by the revolution in shale gas drilling or "fracking," which lowered the cost of generating electricity from cleaner burning natural gas power plants, putting many dirtier and more expensive coal power plants out of business (Barboza and Lange 2018).

Questions remain, however, about how much methane is leaked into the atmosphere from natural gas production and transport. A recent study estimated that the leakage rate was 60 percent greater than the U.S. government had previously estimated. Such a discrepancy is important to evaluating the benefits of natural gas, since the atmospheric warming impact of methane during the first two decades after its release is more than eighty times more potent than carbon dioxide (Guglielmi 2018).

A glut of cheap natural gas also threatens the country's 100 emissions-free nuclear power plants, which generate 20 percent of U.S. electricity. Because the United States does not have a national carbon tax or fee, the climate change benefits of nuclear power plants are not factored into their operating costs. Since 2013, five nuclear plants have closed and six more are scheduled to shut down by 2025, even though these older plants could still operate for decades. In most states, solar and wind power will not be able to take up the slack in electricity generation. Instead, nuclear power will be replaced by dirtier natural gas (Plumer 2017).

"Ecomodernists" have put forward a set of ideas that break from conventional thinking, challenging longstanding paradigms about nature, technology, and progress.

A bright spot may be California, the fifth largest economy in the world. Even as the state's population has surged—its economy has grown by 40 percent over the past two decades—the carbon intensity of California's economy (the amount of carbon pollution per million dollars of economic growth) has declined by 38 percent and is now below 1990 levels. In 2016, the most recent year for which data is available, carbon intensity declined 6 percent even as the economy grew by 3 percent (Barboza and Lang 2018).

The shift is driven by a major decline in emissions from the electricity sector. Not only have state-wide improvements in energy efficiency decreased the demand for electricity even as the economy and population have grown, a sharp drop in the price of solar panels combined with state renewable energy mandates have accelerated the transition from natural gas plants to clean energy sources. Rain in the state after five years of drought also boosted electric generation from hydropower (Barboza and Lange 2018).

Many challenges remain for California. The scheduled shuttering of

the state's last remaining nuclear power plant may shift some electricity generation back to natural gas. Emissions from cars and trucks, already the biggest source of carbon pollution in the state, continue to increase. Lower gas prices until recently have not helped, nor has consumer preference for bigger, less efficient cars and the relatively slow adoption of electric vehicles (Barboza and Lange 2018).

Continued success in California and the United States also hinges on U.S. federal policy. But the Donald J. Trump administration since taking office has installed at major regulatory and scientific agencies fossil fuel industry lobbyists and conservative operatives who have spent their careers casting doubt on climate science and opposing any policies to cut emissions. According to one recent study, the fossil fuel industry and other sectors that are major emitters enjoy a ten-to-one lobbying advantage over environmental groups and the clean energy sector (Brulle 2018). At such a disadvantage, even if Democrats were to win back control of the White House and Congress, any successful climate change–related legislation will not only need some Republican support but also the backing of major players from the fossil fuel industry.

But such concessions are likely to be opposed by many environmentalists, who have gained considerable sway within the Democratic party. To win party primaries, Democrats running in districts and states where liberal voters dominate have pledged to promote a "100% renewables" platform that opposes all new fossil fuel infrastructure, seeks a ban on natural gas "fracking," and demands the closure of nuclear power plants (Nisbet 2015).

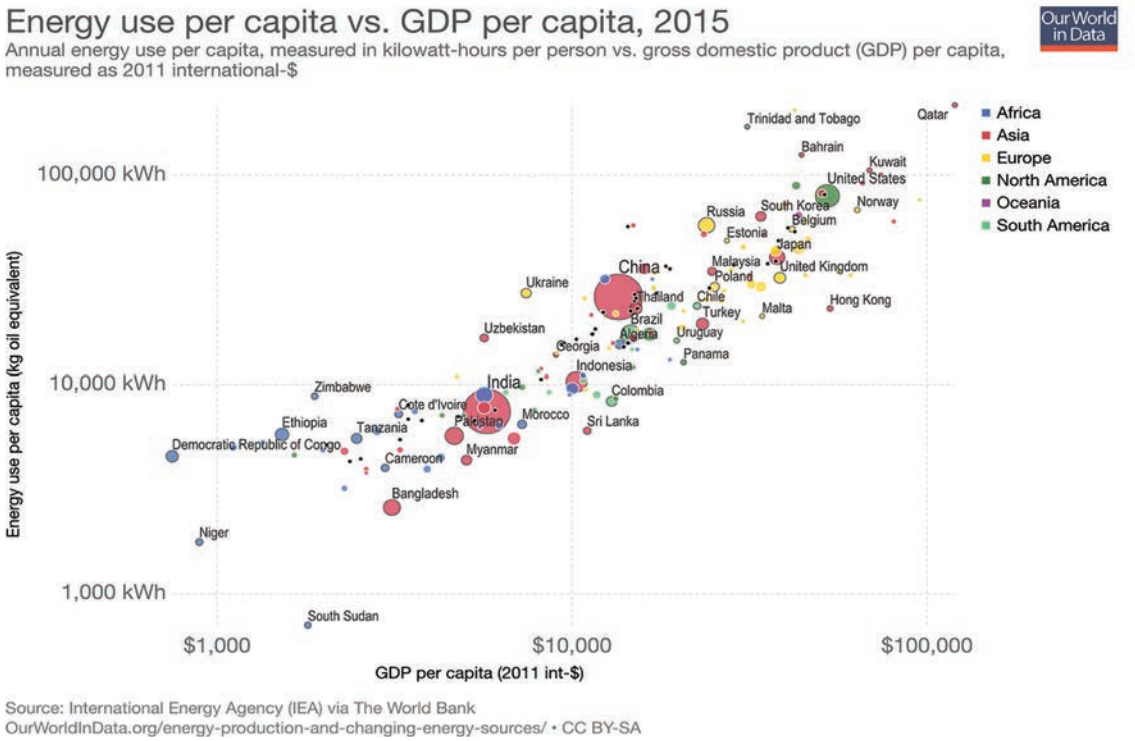
The Rise of Ecomodernism

The roots of ecomodernism can be traced to a handful of influential books, articles, and policy papers first published a decade ago. In 2009's *Whole Earth Discipline*, ecologist and futurist Stuart Brand laid out a range of innovation-driven strategies for achieving a sustainable society. His ideas were captured effectively by the subtitle: "Why Dense Cities, Nuclear Power, Transgenic Crops, Restored Wildlands, and Geoengineering Are Necessary."

Brand correctly warned that "soft energy path" technologies such as solar and wind favored by environmentalists were unlikely to be able to overcome the problems of intermittency, storage capacity, and cost and be scalable in time to alter the dynamics of fossil fuel energy use and dependency worldwide. He and other ecomodernists have pointed to the demand for growth in Asia, Africa, and Eastern Europe and the sunk costs that these regions are putting into coal power and other fossil fuels.

The more than one billion people worldwide who still lack basic access to electricity means that climate change is a reason to accelerate rather than slow energy transitions, echoed the ecomodernist thinkers Ted Nordhaus and Michael Shellenberger (2007; 2013) in a book and numerous essays. Those countries over the past century that have gained access to abundant, cheap forms of energy have achieved huge gains in economic growth and human security. Today, the main imperative for people living in developing countries such as India is to gain the same access and to achieve a Western standard of living.

During the 1960s and 1970s, as North American and European countries achieved economic security and prosperity, their citizens began to put pressure on their governments to accelerate efforts to reduce pollution, slow rates of deforestation, and limit land use, thereby conserving nature rather than destroying it. A similar pattern is occurring in China, which through



Source: International Energy Agency (IEA) via The World Bank
OurWorldInData.org/energy-production-and-changing-energy-sources/ • CC BY-SA

state-managed economic growth has achieved a rising, affluent middle class.

But for growth to continue in China, and for India and other developing countries to also gain access to abundant forms of energy, transformative innovations in "hard energy" path options such as nuclear energy and carbon capture and storage are required, along with similar advances in high-tech solar, energy transmission, and energy storage technologies. These advances would be needed to not only meet the demand for growth in these regions but also limit emissions from the thousands of coal plants already in place and scheduled to be built around the world.

In 2009's *Why We Disagree about Climate Change*, University of Cambridge geographer Mike Hulme argued that climate change had been misdiagnosed as a conventional environmental problem. Instead, it was what policy scholars referred to as a uniquely "super-wicked" problem, not something society was going to end or solve; like poverty or war, it was something that we were going to do better or worse at managing over time. As a super-wicked problem, argue other ecomodernists, climate change is so complex in scale with so many different drivers that a single omnibus solution such as a national carbon tax or an international emissions agreement is unlikely to be either politically enduring or effective. Instead, policies would be needed to be implemented at the state, regional, and bilateral levels and through the private and nonprofit sectors (Prins and Rayner 2007; Verweij et al. 2006).

At the international level, examples include focusing more narrowly on reducing especially powerful, but easier to tackle, greenhouse gases such as black carbon (or soot) from diesel cars and dirty stoves and methane from leaky gas pipes. At the national and state levels, examples of smaller scale policies include government technology procurement programs; major investments in climate change resilience to protect cities, people, and industries; subsidies for renewables, nuclear energy, and carbon capture; funding for clean energy research; and investments in climate resilience efforts. As these smaller successes are achieved, argue ecomodernists, we not only gain more time to deal with the bigger policy challenges but also start to rebuild networks of trust and cooperation across lines of political difference while experimenting with new solutions and technologies (Nordhaus et al. 2011; Prins and Rayner 2007).

These ideas and others have been researched, expanded on, and promoted by the Breakthrough Institute, a left-of-center think tank founded by Ted Nordhaus and Michael Shellenberger.

Halting the many societal gains we have achieved through technological innovation rules out the best tools we have for combating climate change, protecting nature, and helping people.

In 2015, the two brought together sixteen other similarly minded thinkers to author *An Ecomodernist Manifesto*. They argued that climate change and other environmental crises are not reason to call into question the economic policies and technological advances that have enabled human society to flourish over the past century. Indeed, halting the many societal gains we have achieved through technological innovation, they argue, rules out the best tools we have for combating climate change, protecting nature, and helping people. The urgent environmental problems we face are evidence in favor of more modernization, not less (Asafu-Adjaye et al. 2015).

Hope for a better future, they contend, starts with advanced technologies that intensify rather than weaken our mastery of nature. High-tech crops, advanced nuclear power, carbon capture and storage, aquaculture, desalination, and high-efficiency solar panels all have the potential to not only reduce human demands on the environment but also spark the economic growth needed to lift people out of extreme poverty. These advances will enable more people to live in bigger cities that are powered and fed more efficiently. People in cities also tend to have fewer children, slowing population growth. From this perspective, technological advances and urbanization will free up more space on the planet for nature, "decoupling" human development from fossil fuel and resource consumption.

To achieve this future, ecomodernists warn that we have put too much faith in carbon pricing, social-impact investing, venture capital, Silicon Valley, and other market-based "neoliberal" mechanisms to spur technological innovation and social change. We need to instead focus more intensively on understanding how technological advances happen and the role of government planning and spending—rather than the market—as the main driver of innovation and societal change. Once there are technologies available that make meaningful action on climate change and other problems cost less, ecomodernists predict, much of the political argument over scientific uncertainty will diminish. The challenge is not to make fossil fuels more expensive but to make their technological alternatives cheaper and more powerful.

Under these conditions, it will be easier to gain political cooperation from across the ideological spectrum and from developing countries. National leaders and their constituents are far more likely to spare nature because it is no longer needed to meet their economic goals than they are for any ideological or moral reasons. Over the past year, ecomodernist ideas have received a boost from Harvard University cognitive linguist Steven Pinker (2018), who in his best-selling book *Enlightenment Now* devotes his chapter on the environment to advocating on behalf of the philosophy and the need for technologies such as nuclear energy.

Pinker is part of a parallel genre of "New Optimist" authors who have been inspired by the work of Hans Rosling and affiliated data scientists. In TED talks, a recent book, and vividly illustrated graphs available at the website Our World in Data, Rosling and colleagues have shown the many ways in

which human societies are flourishing in the age of climate change, countering a powerful cultural narrative that the world for decades has been in a state of escalating crisis, decline, and suffering (Rosling et al. 2018).

Valuing Dissent

For ecomodernists, technological and political progress also require respectful engagement with a diversity of voices and ideas. "Too often discussions about the environment have been dominated by the extremes, and plagued by dogmatism, which in turn fuels intolerance," they write in the Manifesto.

The challenge is not to make fossil fuels more expensive but to make their technological alternatives cheaper and more powerful.

At their core, ecomodernists believe in applying the Enlightenment principles of skepticism and dissent, which are essential to wise and effective decisions, especially in relation to wickedly complex problems such as climate change. Numerous social science studies demonstrate that in situations where groupthink is closely guarded and defended to the exclusion of dissenting voices, individuals and groups tend to make poorer decisions and think less productively. In contrast, exposure to dissent, even when such arguments may prove to be wrong, tends to broaden thinking, leading individuals to think in more open ways, in multiple directions, and in consideration of a greater diversity of options, recognizing flaws and weaknesses in positions. "Learning and good intentions won't save us from biased thinking and poor judgments," notes UC-Berkeley psychologist Charlan Nemeth. "A better route is to have our beliefs and ways of thinking directly challenged by someone who authentically believes differently than we" (Nemeth 2018, 191).

Acting on these principles, the Breakthrough Institute has invested in twice yearly "Dialogues" in San Francisco and Washington, D.C., creating the rare forum where progressives, liberals, conservatives, environmentalists, and industrialists come together to debate ideas and to connect over civil, cross-cutting conversations. To elaborate on these ideas, the Institute also publishes the *Breakthrough Journal* and produces the podcast series *Breakthrough Dialogues*.

On the road to managing the many threats we face from climate change, grassroots activism and political reforms that hold the fossil fuel industry accountable are important, as is the quest for a more advanced arsenal of technological options and a reconsideration of our economic goals. But so too is investment in our capacity to learn, discuss, question, and disagree in ways that constructively engage with uncomfortable ideas (Nisbet 2014).

Unfortunately, most academics and journalists avoid challenging the powerful forms of groupthink that have derailed our efforts to combat climate change. In this regard, attacks on those who question cherished assumptions have had a powerful chilling effect. We therefore depend on risk-taking intellectuals such as the ecomodernists to lead the way, identifying the flaws in conventional wisdom and offering alternative ways of thinking and talking about our shared future. ■

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[BEHAVIOR & BELIEF STUART VYSE

Stuart Vyse is a psychologist and author of *Believing in Magic: The Psychology of Superstition*, which won the William James Book Award of the American Psychological Association. He is a fellow of the Committee for Skeptical Inquiry.

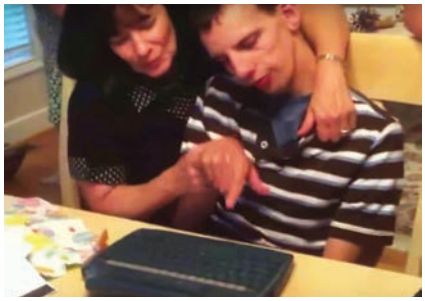
Autism Wars: Science Strikes Back

In the field of autism treatment, the forces for science and evidence have won a few battles and lost a few. Unfortunately, some of the most recent victories have been on the side of pseudoscientific and fad therapies—but a new army of researchers, practitioners, and advocates is fighting back.

Twenty years ago, it looked like facilitated communication (FC), a popular pseudoscientific treatment for autism, was dead. Proponents had suggested that many people with autism were trapped inside broken bodies. Autism was not a cognitive problem but instead a physical one. Inside these non-speaking people were intelligent, expressive minds, and if someone—a facilitator—just steadied their hands over a keyboard, FC could unlock the thoughts and feelings of the person within. Suddenly, with the help of their facilitators, people who were previously unable to speak were writing books and poems and going off to college. The promise of FC was so miraculous that it spread like wildfire.

But in the early 1990s, the first empirical tests of the technique began to appear, and the results were devastating. In virtually every case, controlled studies revealed that the facilitator—the autistic person's helper—was doing the typing, not the person with autism. It was a Ouija board–like phenomenon. The facilitators appeared to be entirely unaware that they were the authors of the words on the screen.

This research was a substantial blow to the proponents of FC, and a 1993 PBS Frontline episode, "Prisoners of Silence" (Palfreman 1993), was particularly effective in discrediting the technique. Major professional organizations, including the American Psychological Association, the American Academy of Pediatrics, American Academy of Child and Adolescent Psychiatry, and the American Speech-Language-Hearing Association issued policy statements against the use of FC, and teachers and therapists went back to using more validated methods of educating people with autism. So by the mid-1990s, it looked like the FC controversy was over, and science had won. Unfortunately, the story did not end there.



Full hand-over-hand facilitated communication, sometimes called supported typing. (Source: YouTube.)

As readers of this column know, FC has surged back, and the autism wars have resumed on a number of new fronts. First, the pro-FC crowd criticized and denied the research. Syracuse University Professor of Education Douglas Biklen (2005), who is the primary promoter of FC in the United States, claimed the research methods used to evaluate FC were not suited to the particular needs of people with autism and had caused test anxiety. Many parents continued to believe their children were articulate writers whose brains were capable but whose mouths, hands, and arms did not work properly. Pro-FC researchers using less rigorous methods appeared to show some evidence of independent typing in a few individual students, promoting belief in the technique (Mostert 2010).

Second, new variations of FC were introduced that looked different but shared the same problems. The most popular of these new techniques is Rapid Prompting Method (RPM) developed by Soma Mukhopadhyay (2013). In this case, instead of hand-over-hand guidance on a keyboard, the person with autism points to a letter board, and a teacher or assistant reports the words tapped out. RPM is different from FC, but it has the same potential for unconscious prompting because the letter board is always held in the air by the assistant. As long as the method of communication involves the active participation of another person, the potential for unconscious guidance remains. Perhaps having learned a lesson from the FC episode of the 1990s, proponents of RPM have avoided participating in research studies that might test its validity, and its popularity has grown. Furthermore, the original, thoroughly discredited version of FC continued to be promoted by a number of universities and professionals.

For those who lost track of the FC story back in the 1990s, the resurgence of pseudoscience was a surprise. Twenty years earlier science had spoken, and that should have been that. But the promise of uncovering an intelligent, articulate child was just too appealing, and as a result, for some parents and professionals, FC became a system of belief.

Science Strikes Back

Although many of the recent battles have been won by the proponents of FC, RPM, and other related pseudoscientific therapies, in the years since the 1990s, the scientific viewpoint has scored some victories, particularly in the courtroom. Some of the earliest challenges to FC came when parents or others were falsely accused of sexual abuse through FC. Typically, a child with autism would type out a message describing acts of sexual abuse allegedly committed by a parent or someone else. When these cases went to trial, an essential question was who was writing the abuse claims: the child with autism or the facilitator? In several cases, a simple double-blind test was able to show that the facilitator was the author of the abuse claims, not the person with autism. After these tests were conducted, defendants were usually acquitted or the charges were dropped. Unfortunately, these victories came at a heavy cost, because the courts move slowly and people's lives can be damaged in the process. As recently as spring of 2018, a Hialeah, Florida, man was arrested and held in jail for thirty-five days while his case progressed (Ovalle and Gurney 2018). He was eventually released without any charges filed, but in addition to his incarceration he had to endure the humiliation of having his picture, complete with prisoner's orange uniform, published in the *Miami Herald*—despite having done nothing wrong. No picture of the teacher who authored the false claims appeared in the paper. If this is a victory for science, it is an unsatisfying one.

Facilitated communication has surged back, and the autism wars have resumed on a number of new fronts.

Another development on the side of science has been the emergence of some very good writing on the topic. Much of this has come from national-level science journalists, including *Slate*'s David Auerbach ("Facilitated Communication is a Cult That Will Not Die" [Auerbach 2015]), *Forbes*'s Steven Salzberg ("Facilitated Communication Has Been Called an Abuse of Human Rights. Why Is It Still Around?" [Salzberg 2018]), and Kavin Senapathy, who writes both for *Forbes* and here at Skeptical Inquirer ("On Unsubstantiated Yet Prevalent Therapeutic Interventions for Autism—Part II" [Senapathy 2018]). In addition, Daniel Engber has been the leading reporter on the case of Anna Stubblefield, the Rutgers University philosophy professor who used FC to gain consent for a sexual relationship with a nonverbal man with cerebral palsy. Her first conviction and sentence of twelve years in prison for sexual abuse was thrown out on appeal (due to the judge's exclusion of some evidence in the first trial), but after serving less than two years of her sentence, Stubblefield avoided a second trial by pleading guilty to third-degree sexual assault, for which she was sentenced to time served and fifteen years probation (Napoliello 2018). Engber has covered this case at great length for both *Slate* (2017) and the *New York Times* (2018). Finally, Thomas E. Heizen, Scott O. Lilienfeld, and Susan A. Nolan (2015) published a wonderful little book called *The Horse That Won't Go Away: Clever Hans, Facilitated Communication, and the Need for Clear Thinking.*

True Voices

Despite these few glimmers of light on the side of science and reason, the current state of the conflict appears to favor the forces of pseudoscience. RPM continues to spread, and it has been aided by a relatively new autism advocacy group, the Autistic Self-Advocacy Network (ASAN, http://autisticadvocacy.org/), that frames people with autism as a minority whose rights to communication have not been respected. In the view of ASAN, access to RPM is part of the right to communication, and the organization advocates for its use. For example, having published a policy statement about FC back in 1995, in May 2018 the American Speech-Language-Hearing Association (ASHA) posted a draft policy discouraging the use of RPM, a final draft of which was accepted in August (American Speech-Language-Hearing Association 2018). The ASAN advocacy group quickly issued a statement opposing this policy (Autistic Self-Advocacy Network 2018) claiming that the ASHA's "blanket statement that specific forms of communication are *per se* inauthentic robs us of the right to communicate."

This was not ASAN's first statement promoting RPM. In March 2016, ASAN filed a complaint with the U.S. Department of Justice in support of students in the Arlington (Virginia) Public Schools who were denied the use of RPM (Autistic Self-Advocacy Network 2016). RPM was not mentioned by name, but the complaint states that the students in question communicate best by "spelling words by pointing to letters on a letter-board held by a trained supporter."

Recognizing that the war was not yet won, a group of science-minded advocates, researchers, and professionals have launched a new effort. They call themselves "True Voices," and they are going on the offensive. Their first target was the University of Northern Iowa (UNI), which, in June 2018, sponsored the "Midwest Summer Institute: Inclusion and Communication," cosponsored by the Syracuse University Institute for Communication and Inclusion, which was formerly known as Facilitated Communication Institute. The conference schedule included a session called "Intro to Facilitated Communication Training" and offered college credit from the University of Northern Iowa to attendees. In the weeks before the UNI institute, five scientists wrote an article in *The Conversation* (Hemsley et al. 2018) that dramatically highlighted the kind of damage that can be—and has been—done by FC. Next the group drafted a "Letter of Concern" about the UNI institute, signed by over thirty professionals and academics, and sent it to several officials at the university.

Attacking public institutions is an excellent strategy. Universities are supposed to be places of enlightenment and reason, and where public funds are involved, the promotion of discredited ideas is particularly controversial. Furthermore, attacking universities that lend credence to FC has proved to be

an effective approach in the past. In May 2015, I wrote an article on FC in which I mentioned that the University of New Hampshire Institute on Disability (IOD) regularly sponsored an "FC skill builders" group (Vyse 2015). Seven months later, I was contacted by the director of the institute who told me he had read my article and wanted me to know that, after a lengthy review process, the IOD had decided to cease all activities related to FC. I added an update about this development to the archived web version of the article.

It would be a mistake to think my article caused the change at IOD. I am sure they received criticism from a number of fronts. But the fact that the director contacted me suggests that he was interested in correcting the public record.

The True Voices effort at UNI has also begun to produce results. First, the episode provoked a flurry of bad publicity for the university. The previously mentioned *Forbes* article by Steven Salzberg was released the same week as the Midwest Summer Institute and mentioned it directly, asking why a university would offer college credit for instruction in a thoroughly discredited therapy. Other outlets publishing articles included *Inside Higher Ed* and the Syracuse University student newspaper, the *Daily Orange*. Syracuse University is the mecca of FC because Douglas Biklen is an emeritus professor of education, and the Institute for Communication and Inclusion is housed there. Nonetheless, the *Daily Orange* has been a consistent critic, publishing a number of well-researched articles on FC.

Closer to home, two highly critical articles quoting members of the True Voices group appeared in the local Cedar Falls newspaper. The first article, "Facilitated Communication Conference Draws Fire at University of Northern Iowa" (Miller 2018a) was published just prior to the conference. The second article was released the same week as the conference, after the university had received the letter of concern (Miller 2018b). It reported that the university would form a committee to look into the institute:

> We regularly evaluate UNI's sponsorship of conferences and events to ensure that we are supporting high-quality programming consistent with the mission of the university. As part of this regular review, we will be convening a group of faculty experts from across campus to discuss the practices presented at this conference. (UNI spokesman Scott Ketelsen [Miller 2018b])

So, if nothing else, the True Voices offensive forced the University of Northern Iowa to endure some public criticism and prompted the administration to re-evaluate their involvement with FC. If the experience at University of New Hampshire is any indication, UNI may choose to cut their ties to this discredited and dangerous technique. We can only hope.

As I write this, the next target on the True Voices' radar is a two-day conference on FC at the University of Syracuse scheduled for October 2018. I will report back on what happens there. ■

Disclosure: I am also a member of the True Voices group.

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Harriet Hall, MD, also known as "The SkepDoc," is a retired family physician, a CSI fellow, and an editor of the *Science-Based Medicine* blog. Her website is www.skepdoc.info.

Diving into the VAERS Dumpster: Fake News about Vaccine Injuries

Vaccines are unquestionably one of the greatest triumphs of modern medicine. Smallpox was the deadliest scourge in human history, responsible for 300 million to 500 million deaths in the twentieth century alone, when it was already on its way out. Thanks to vaccines, smallpox has been completely eradicated. And now polio is well on its way to eradication. Today it occurs in only three countries: Pakistan, Afghanistan, and Nigeria (except for a recent isolated case reported in Papua New Guinea).

How quickly we forget! Only some of us older folks can remember our parents not letting us go swimming in the summer because of polio risk. We've made great progress against many other vaccine-preventable diseases. Today's children won't get sick with chickenpox, mumps, and measles like I did. We even have two vaccines against viruses that cause cancer: human papillomavirus (HPV) and hepatitis B.

Vaccinations constitute a wonderful insurance policy. You'd think no one would want to refuse that protection. But plenty of people do, because of misinformation being spread by misguided vaccine opponents. I'll call them antivaxxers. They may protest, like Jenny McCarthy, that they're not against vaccines but just want safe vaccines or a delayed schedule. But they are clearly antivaccine. They are vaccine denialists, not vaccine skeptics. They reject the overwhelming scientific evidence for the safety and effectiveness of vaccines. And they're endangering us all by reducing the herd immunity in our communities.

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Antivaxxers claim that vaccines cause all sorts of terrible harm. The biggest kerfuffle was over concerns that the MMR vaccine caused autism. For a time, the mercury-based preservative thimerosal was blamed; however, when thimerosal was removed from vaccines, the rate of autism didn't decline. Multiple scientific studies have failed to even find any correlation between vaccines and autism, much less evidence of causation. In fact, one study seemed to show that vaccine recipients were *less* likely to be diagnosed with autism.

VAERS

Antivaxxers *love* the U.S. Vaccine Adverse Event Reporting System (VAERS). They gleefully point to it as evidence that vaccines cause serious adverse effects and deaths. However, they don't understand how VAERS works. It doesn't collect data systematically, nor does it constitute proof of harm from vaccines. It accepts any and all anecdotal reports from patients, doctors, lawyers, or anyone who thinks

an adverse event has happened after a vaccination. The anecdotes are neither investigated nor verified. There is evidence that whenever a particular adverse event such as autism is being litigated, the number of reports of that adverse event in VAERS increases. Perhaps the litigants are putting more reports into the system so they can present the data as evidence in the courtroom.[1]

Anyone could lie and put in a false report. Dr. James Laidler did just that. He submitted a report saying that after he got a flu shot, his skin turned green and his muscles swelled up; he described turning into the Incredible Hulk comic book character. His report was accepted and entered into the database. To the credit of VAERS, they noticed that the report was suspicious, so they phoned him and asked his permission to remove it, which he readily granted. Had he refused, the report would still be in the database and antivaxxers could point to proof that the flu vaccine turns people into Incredible Hulks.

VAERS data can be useful when used appropriately. There were a number of reports of intussusception (where a section of bowel "telescopes" into an adjacent section, causing blockage and cutting off blood supply) after the older RotaShield rotavirus vaccine. An investigation showed there really was a connection, and that vaccine was taken off the market. But the anecdotes in VAERS are only a starting point. Reports of deaths are investigated; in most cases, they have found a non-vaccine cause of death. One girl who died after the HPV vaccine was found to have died of a drug overdose. In other cases, there was not enough information to determine the cause of death.

Antivaxxers love the U.S. Vaccine Adverse Event Reporting System (VAERS). They gleefully point to it as evidence that vaccines cause serious adverse effects and deaths. However, they don't understand how VAERS works.

Anecdotes alone are not data. Bad things can happen to anyone. We need to know if they happen more often in vaccine recipients than in the general population. If so, that establishes a correlation. But a correlation is not enough to establish causation. You may remember the graph showing an almost perfect correlation between autism diagnoses and the sales of organic food.

In a study that reviewed VAERS data looking for causality, "Causality was thought to be probable or definite in less than one quarter of reports, and these were dominated by local reactions, allergic reactions, or symptoms known to be associated with the vaccine administered."[2] Most of these were "probable." Only 3 percent were "definitely" related to the vaccine, and most of those were not serious.

Relying on VAERS has been described as dumpster diving for data. The antivaxxers love that sport. For the

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HPV vaccine Gardasil, they proclaim, "Gardasil is killing women!" They cite VAERS reports of thirty-two deaths and 12,000 complaints. In reality, after more than 170 million doses, *no* death has ever been linked to Gardasil.

Another favorite tactic of the antivaxxers is to claim that the government knows vaccines are harmful and it pays out money to compensate victims.

For HPV vaccines, none of the events reported to VAERS was found to be any more common after HPV vaccination than among the comparison groups. In a large controlled study, only two things were associated with the HPV vaccine: venous thromboembolism (VTE, or blood clots) in 0.2/100,000 doses and fainting after the injection in 8.2/100,000 doses. The numbers for VTE were not statistically significant, and most of the patients had other risk factors for VTE. Causation was not established. In another study with 200,000 subjects, they only found a correlation with fainting (six times as likely in recipients) and skin infections in the two weeks following vaccination (1.8 times as likely in recipients).

Japanese Oversight

One bit of fake news that's been circulating is the rumor that Japan banned the HPV vaccine; in fact, it did no such thing. The vaccine has been available for free in Japan since 2010, and it is still available for free. What happened was that the Japanese government temporarily suspended their *official recommendation* to get the vaccine while they investigated anecdotal reports that thirty-eight girls had experienced pain and numbness after vaccination. The investigation was soon completed, and it found the vaccine wasn't responsible. But for some reason, they never got around to reinstating the recommendation. As a result, completion rates for the HPV vaccine series plummeted from 74 percent to 0.6 percent. This is very unfortunate. It means Japanese children have been deprived of the protection against cancers caused by HPV. That includes cervical, anal, oropharyngeal, vaginal, vulvar, and penile cancers. It can take twenty years or more for those cancers to develop: a few decades from now, Japan will be seeing cancers that could easily have been prevented. Even if they don't get cancer, some people will develop genital warts and other STD symptoms that could have been avoided.

Hepatitis B Vaccine

The hepatitis B vaccine is routinely given to newborns in 184 countries. It has an excellent safety record. After over a billion doses given, the only serious adverse event that has been identified is an allergic reaction in fewer than one in a million recipients. It is given to newborns because the younger the age at infection, the more likely hepatitis B will persist as a chronic infection that carries a risk of liver failure and liver cancer later in life. A whopping 80–90 percent of those infected before the age of one will develop a chronic infection, compared to only 5 percent of adults. It's clearly working: the incidence of hepatitis B infections in the United States has dropped dramatically since we began vaccinating newborns.

The antivaxxers ignore these facts and offer their own version. Here's what one antivaxxer said about the hepatitis B vaccine:

> It is a toxic exposure that has unknown and unpredictable effects. It has never been appropriately studied in humans (true placebo control), and what we are observing from population-based reports is that 443,093 adverse events (headache, irritability, extreme fatigue, brain inflammation, convulsions, rheumatoid arthritis, optic neuritis, multiple sclerosis, lupus, Guillain-Barre Syndrome (GBS) and neuropathy) have been registered including >1500 deaths, often labeled as Sudden Infant Death Syndrome.[3]

None of that is true. The writer had to dive deeply into the VAERS dumpster to come up with these fantasies. Talk about fake news!

The Vaccine Court

Another favorite tactic of the antivaxxers is to claim that the government knows vaccines are harmful and it pays out money to compensate victims. They cite cases from the National

Vaccine Injury Compensation Program (NVICP), also known as the Vaccine Court. NVICP is a no-fault system for litigating vaccine injury cases. It was established in 1986 in response to a threat to the vaccine supply. Disregarding strong scientific evidence about the safety of the DPT vaccine, juries had been awarding large sums to plaintiffs who claimed they had suffered vaccine injuries. In self-defense, most companies had stopped producing the DPT vaccine.

Under the provisions of the National Childhood Vaccine Injury Act, vaccine injury lawsuits can no longer be filed in state and federal courts. Instead, these cases are heard by a Special Master in the U.S. Court of Federal Claims. The petitioner must present a biological theory of harm, give a logical sequence of events connecting the vaccine to the injury, and establish an appropriate time frame in which injury occurred; the petitioner must also show that there is not another biologically plausible explanation for the injury. These are legal requirements and are not sufficient to establish scientific truth. In 2006, an award was granted to a petitioner who claimed that a hepatitis B vaccine caused her multiple sclerosis (MS), despite several scientific studies showing that the vaccine doesn't cause or exacerbate MS.

Some recognized vaccine injuries are listed in an official Table of Injuries along with a time frame. For instance, anaphylaxis is known to sometimes (rarely) occur with vaccines, and it usually occurs within four hours of the injection. For a claim of vasovagal syncope, it must have occurred within an hour. If an injury is listed on the table and the time frame is appropriate, compensation is automatically granted. For off-table injuries, the claimant has to show that it is more likely than not that the vaccine caused the harm. The standard of proof is much lower than in regular courts.

In short, this is a no-fault system designed both to preserve the vaccine supply by protecting manufacturers from liability and to facilitate compensation for people who are assumed to have been injured by vaccines. A successful lawsuit does not constitute scientific proof that the vaccine caused the injury.

Vaccines are safe. The antivaxxers are trying to create a "manufactroversy" based on dumpster diving for data in VAERS and other sources of misleading information. They are spreading fake news. Remember, VAERS is very unreliable. ■

Notes

1. http://scienceblogs.com/insolence/2008/01/18/how-vaccine-litigation-distorts-the-vaer/
2. https://www.ncbi.nlm.nih.gov/pubmed/23063829
3. https://kellybroganmd.com/hepatitis-b-vaccine-for-your-newborn/

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[SKEPTICAL INQUIREE BENJAMIN RADFORD

Benjamin Radford is a research fellow at the Committee for Skeptical Inquiry and author or coauthor of ten books, including *Investigating Ghosts: The Scientific Search for Spirits*.

Channeling Ancient African Wisdom—or Not

Q: I'm producing a documentary about channeler Neferatiti Ife; I would like your opinion about her work and on channeling from a historical perspective. What's your take on what she does?

—M. Shabazz

A: I received this query from a filmmaker seeking an analysis in early 2018. I explained that time constraints didn't allow for an in-depth investigation of her work and claims, but that I could review materials and offer an overview, putting her in the context of other channeling claims. I was sent some samples of her readings and found more online.

Ife describes herself on her website:

> [I am] an Author, Channeler and Healer. My latest book is called *Shine Your Divine Light*. Over the last 9 years, I've developed my psychic channelling abilities, connecting with Ancient ancestral beings as well as Light beings from the ethereal world. These communications led to the publication of my first book, *Conversations with the Blackman's God*. As well as being an experienced psychic communicator, I hold a Post Graduate Diploma in Therapeutic Counselling, Bachelor of Social Science Degree in Social Work and a Sociology Degree [she does not specify which institutions she attended].

An April 2018 workshop in London, England, titled "African Ancestral Channelling and Healing Workshop" offered the following description:

> If the heart is open and the lower area has healed the energy from mother earth comes up and reaches the head and crown area in the body. If this area is healed, the energy from mother earth comes up and the energy from father sky comes down and the energy mass meets in the middle. creating a powerful vibration ... You will now be able to hear the words of the spirit world, you will be guided and be more at peace within ... You will receive a guided meditation to relax, empower and acitvate [*sic*] your mind, body and spirit.

The practice of channeling—a person's body being taken over by a spirit for the purpose of communication—has been around for millennia. There are countless stories of shamans, witch doctors, prophets, and others who claim to hear voices or receive some supernatural knowledge from the spirit world. Channelers, also sometimes known as psychic mediums, often use what are called "spirit guides," friendly spirits who give them knowledge and help them on their spiritual journeys. To achieve the expanded state of consciousness necessary for connection, the channeler usually meditates, trying to break free of worldly influences and tune in to a higher consciousness. They may imagine themselves seeking out specific spirits of the dead, or they may be contacted by some unknown force that wishes to communicate.

Ancient spirits channeled through modern mediums have supposedly written entire books. In fact, there are hundreds of such books, many of which can be found in New Age sections of bookstores and libraries. One of the most famous American channelers in the 1970s was Jane Roberts, who claimed to channel an ancient entity named Seth. For her 1972 best-seller *Seth Speaks*, as well as several popular sequels, Roberts—as Seth—dictated esoteric information to her husband about the soul, the nature of conscious-

The practice of channeling—a person's body being taken over by a spirit for the purpose of communication—has been around for millennia.

ness, spiritual truths, higher planes of reality, and so on. Since the 1980s, New Age mystic J.Z. Knight has claimed to channel Ramtha (also known as "The Enlightened One"), a 35,000-year-old warrior spirit who described, among other things, being born on the (fictional) continent of Atlantis. Knight became a multi-millionaire writing books and offering seminars and DVDs teaching the wisdom imparted to her by Ramtha. Channeling has waned in popularity in recent years, though it is still practiced (and its reality widely accepted) in the New Age community.

There seems to be no real evidence that the information is truly coming from unseen spirits or some omniscient cosmic consciousness instead of the channeler. One thing that virtually all channeled information has in common is that it is subjective, mystical, and completely unverifiable, often including themes of universal love, messages from God, cosmic unity, and so on. Since there is no way to verify information and descriptions of different planes of existence, the nature of the soul, and so on, there's no way to know which, if any, of the channeled information is accurate.

It's all well and good that channeled omniscient spirits can presumably tell us that the cosmos is filled with love, that we make our own happiness, and so on. But when it comes to important, practical information that could benefit mankind (like finding important lost archaeological sites, directing us to a cure for cancer, or warning us of devastating natural disasters), they are conspicuously silent.

The real explanation for channeling lies in psychology, not psychic powers. As psychologist James E. Alcock of York University notes in *The Encyclopedia of The Paranormal*, "the supposed phenomenon is actually very old, for it is simply automatism—automatic behavior over which an individual denies any personal control. ... Today we recognize that automatism is a form of dissociation, an altered state of consciousness, in which an individual is capable of speaking or acting without awareness of deliberately doing so." In other words, when a person meditates and clears his or her mind, random thoughts, images, and symbols may spontaneously arise. In this harmless dissociative state, though it may seem that this information is coming from another consciousness outside the body, in fact it is generated by the mind itself. It's the same process by which artists and musicians may suddenly be inspired by a great thought, or how we dream of things we think we'd never have imagined or thought of. In the end, there is nothing pathological about channeling, but neither is it an unexplained conduit to another dimension.

There seems to be no real evidence that the information is truly coming from unseen spirits or some omniscient cosmic consciousness instead of the channeler.

Ife is the author of several channeled meditation CDs and a deck of cards. She also offers workshops on holistic healing:

> Our African Ancestors are vital to our existence but their voices and wisdom are rarely heard to our detriment. My work is about bringing forth these voices and information from the higher dimensions—for the healing of the nation. The voices and the wisdom of our ancestors have been missing from our lives for far to [*sic*] long. This is to our detriment, and damaging to the future of our children and planet Earth. It's time to step into a new future. A future where the Gods and Goddesses activate and shine their light. This is the place for you. I am here in this time to bring positive word vibrations and energy to start the transformative process of Planetary Enlightenment. My work is to assist the awakening of those who are ready to take the journey and walk on the path of enlightenment. Planet earth is in pain at the moment—both the environment and individuals. The process of healing needs to start now so the frequency of the planet becomes one of Peace, Harmony and Light.

If this sounds familiar, it should; most of Ife's lessons echo rather typical New Age beliefs, limned with a bit of Afrocentrism and an added emphasis on ancient Egyptian cosmology. Ife also offers something she calls the "Ankh Healing System":

> [The Ankh Healing System is] a three pronged meditation system. Neferatiti brings in these guided Ancestral meditations. Ancestors of light and complete postivitity [*sic*]. They come forward from the spirit world but were born in the African continent. This energy is for the vibrational healing of people in this time. Neferatiti's DNA links her back to the African continent and she is bringing forth this vibrational healing on this planet. It is a powerful unique healing system inspired by her connection with the Ancestral world.

If this system of spirit-guided vibrational healing can be scientifically validated, it should of course be incorporated into treatment plans at the world's top hospitals, but as of this writing it's only available—for a reasonable fee of course—from Neferatiti Ife. ■

UFO IDENTIFICATION PROCESS

There is a wide variety of natural explanations for things we see in the sky that are easy to misinterpret.

JOE NICKELL AND JAMES MCGAHA

The important things to remember about UFOs are, first, that they are just alleged sightings that are unidentified—that is, they are not proof of anything—and, second, that eyewitnesses make identification difficult by so often being mistaken. As UFO investigator Allan Hendry (1979, 6) aptly noted, "We only get to study reports of UFOs—not the UFOs themselves."

The term *UFO* is problematic. Often the phenomenon is neither "flying" nor an "object"; consider, for example, a bright disc that is really only the effect of a searchlight playing on a low cloud layer. *Unidentified aerial phenomenon* would be a more inclusive term (although itself not always accurate), but it seems we are stuck with *UFO*. Unfortunately, UFOs are mostly reported by untrained observers—those lacking necessary expertise in astronomy, atmospheric phenomena, aeronautics, physics, and perception, among other factors (McGaha 2009; Frazier et al. 1997). So, the widespread attitude that because they are unidentified they are therefore probably extraterrestrial craft is a logical fallacy called arguing from ignorance.

In fact—with careful, prompt investigation—most UFOs become IFOs, identified flying objects. To assist in this process, we have prepared the accompanying table (on pp. 35–36). It is necessarily oversimplified due to the number and complexity of factors involved. It cannot, of course, be expected to identify something that never existed (for example, a false claim) or that is—as so often is the case—seriously misperceived (such as a reflection on one's window or windshield being perceived as a bright object at a distance). Nevertheless, the chart introduces several of the most common descriptions of UFOs, together with some of their possible identifications. (We have drawn heavily on Allan Hendry's *The UFO Handbook* [1979], supplementing it with other sources—e.g., Klass 1976, Sheaffer 1980, and Frazier et al. 1997—as well as our own experiences.)

UFOs are mostly reported by untrained observers—those lacking necessary expertise in astronomy, atmospheric phenomena, aeronautics, physics, and perception.

Observational Issues

Sightings are influenced by the conditions under which they are observed. For example, bright stars and planets may become UFOs due to being watched from a moving car and thus seeming to keep pace with it (Hendry 1979, 27).

An important basic observation-related fact is that neither an estimate of the presumed craft's distance from the viewer nor its size or speed can be made unless one of the factors is known. With multiple unknowns, one is simply engaging in the wildest guessing. If the guess as to one of the three factors is in error, the others will be wrong accordingly.

The only way to objectively evaluate an object or light in the sky is by first characterizing it with (1) *angular velocity* (how fast it is moving through the sky, measured in degrees per second), (2) *angular size* (measured in degrees—for example a full moon subtends an angle of half a degree), and (3) *angular position* (measured in degrees of altitude and azimuth).

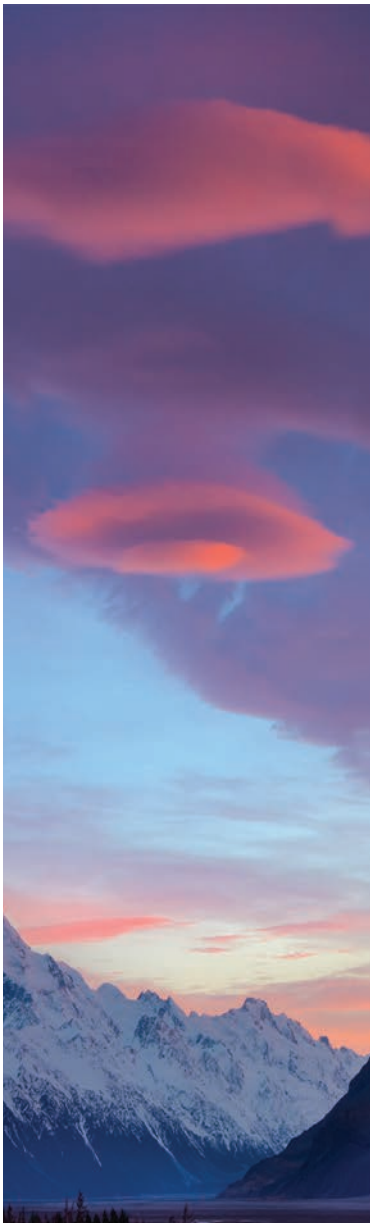
Illusions

For our purposes here, we define *illusion* as a deceptive but objectively existing image—that is, something that can actually be seen (and photographed), such as a mirage. We distinguish this from the mental image that is imaginary, hallucinatory, or the like, understanding that one can transform an objective image into something quite different by mental action (for example, one's expectation may transform a light into the perception of a shiny metallic object).

Various common illusions need to be understood. One can occur when the observer stares at a bright light in the dark, whereupon it may seem to dart about, zigzag, wobble, etc. This can be caused by the natural, involuntary jerking movements of the human eye and is known as the *autokinetic effect* (Hendry 1979, 26, 44, 95).

Another illusory effect includes the movement and flashing of colors that are sometimes ascribed to a bright UFO seen at night. Called *scintillation*, it causes the "twinkling" of stars due to atmospheric turbulence—or of planets when our atmosphere is especially turbulent. It may occur even on a clear night and can affect a single celestial light (Hendry 1979, 26). Indeed, scintillation can affect *any* visible point of light. The effect results from refraction (bending) of the different wavelengths, producing (to the eye or camera) the changing colors and motion.

An *illusion of hovering* can occur when, for example, a slow-moving craft flies directly toward or away from the observer. This gives the impression that the "UFO" is remaining motionless and thus "hovering." In one case, a New Hampshire UFO with colored lights appeared to remain stationary for a minute before it "moved away" from the observers "as if sensing their approach." It was, in fact, a well-lit airplane, a DC-9, making its final approach to an airport. In one instance



UFO Identification

I. DAYLIGHT OBJECT(S)/LIGHT(S)

A. Round, oval, or teardrop-shaped; noiseless

1. **Remains in substantially same position** (perhaps with distortions, changes in brightness) = possibly Venus
2. **Has generally steady course; perhaps with rapid speed, sharp turns** = possibly airplane
3. **Hovers; moves slowly, intermittently; or wobbles =** possibly large research balloon
4. **Moves rapidly, climbs fast, or abruptly changes course; moves with the wind** = possibly small balloon
5. **Streaks across sky**
   - **a.** Duration usually less than ten seconds (rarely longer than twenty) = possibly meteor (see also II.D.1)
   - **b.** Duration longer than that of a meteor = possibly rocket-booster or satellite reentry (see also II.D.2)

B. Oblong, winged, or domed-saucer shape; typically noiseless

1. **Has duration up to five minutes** (rarely over fifteen minutes) = possibly aircraft (perhaps seen on edge)
2. **Has long duration** = possibly helicopter

C. Saucerlike object

1. **Disc-shaped object(s) having long duration** = possibly lenticular cloud(s)
2. **Similar to above but more ragged looking and with edge iridescence** = possibly iridescent cloud(s)
3. **Ringlike or donut-shaped** = possibly a "hole punch" cloud (caused by ice crystals rapidly building up until the center falls out and evaporates)

D. Multiple objects

1. **Are moving as cluster** (like a bunch of grapes) = possibly a group of balloons (see I.A.4)
2. **Are moving separately** = possibly a group of airplanes, balloons, etc. (listed in I.A. above)
3. **Are moving in formation** (especially inverted-V shape) = possibly airplanes or flock of birds

E. Bright objects near the sun

1. **Very bright, nearly round spot** (sometimes colored) seen to one or both sides of sun = possibly sundog (parhelion)*
2. **Pillar of light beneath the sun** = solar pillar*
3. **Bright-light "flying saucer" seen above the sun** = possibly a Parry arc*

(*caused by refraction of ice crystals)

a UFO—another plane—was reported "hovering" in the distance for some twenty minutes (Hendry 1979, 37–38).

Size can also be illusory. For example, it is a human tendency that the brighter a light appears, the larger it is perceived.

The dramatic "disappearance" of a UFO may occur for a variety of reasons. An aircraft may shut off its bright lights or change the angle at which the observer views it. As well, a star, perhaps watched for a long time due to its flashing colors, may be obscured suddenly by moving clouds (Hendry 1979, 26, 38).

Many illusions occur in daytime as well. For example, a UFO that appears to move against the wind, and so supposedly cannot be a balloon, may be propelled by high-altitude winds that can differ in direction from ground winds (Hendry 1979, 61).

The UFO Impostors

Many things can go unidentified in the day or night sky, particularly to untrained observers—as most people are. (Interestingly, according to one study [Hynek 1977, 261] even pilots make "relatively poor witnesses"—no doubt because they are trained to fly airplanes, not identify a UFO under unknown and perhaps unusual conditions.) The following flying-saucer impostors offer specific identification problems.

Stars and Planets. Bright stars and planets represent the primary UFO impostor. As we saw earlier, their seeming ability to dart, wobble, or zigzag and to change color rapidly (the effects of autokinesis and scintillation—especially when exaggerated by binoculars and telescopes) make them ideal candidates for UFOs. Certain stars (Antares, Arcturus, Capella, Sirius, and Vega)

UFO Identification (cont'd)

II. NOCTURNAL LIGHT(S)/OBJECT(S)

A. Usually point source of bright light (but potentially variety of shapes); noiseless

1. **Remains in substantially same position over long period** (perhaps with darting movements, strobe effect, flashing colors) = possibly bright star or planet
2. **Is starlike but slow moving** = possibly satellite or distant airplane (see B.1–4)

B. White or colored lights (various poorly seen shapes) in motion; typically noiseless

1. **Has white, red, and green lights** (almost endless variables in appearance and motion) = possibly airplane
2. **Has white, rapidly strobing light(s),** perhaps with red and green lights, slowly moving in the sky = possibly drone (or drones)
3. **Consists of widely spaced lights giving effect** (by connecting dots) of gigantic craft = possibly multiple planes
4. **Exhibits row of lights flashing in sequence** (potentially giving effect of a rotating disc)
   - **a.** has white lights (perhaps with single red taillight) = possibly advertising plane
   - **b.** has red lights = possibly military refueling plane

C. Light or lights with great freedom of movement (hovering, moving side to side or up and down, etc.)

1. **Is noiseless** = possibly helicopter (often sound goes unheard or special muffler may be used)
2. **Has unusual, rhythmic noise; craft larger than helicopter** = possibly military helicopter

D. Fiery light(s)

1. **Streaks for one to twenty seconds; with or without tail** = possibly meteor
2. **Has slower speed than above in flat trajectory, usually eastbound** = possibly re-entry of man-made orbiting object.
3. **Lasts one to fifteen minutes** (perceived) with indications of "flickering," "sparks," "dripping fire," etc.; eventually burns out = possibly prank balloon with attached road flare
4. **Has multiple drifting lights that sputter and eventually burn out at different times** = possibly parachuted flares (dropped as military exercise)
5. **Appears as spherical-shaped, often red/orange object during thunderstorm** = possibly ball lightning or other atmospheric electrical effect

E. Brilliant flashes of light lasting a few seconds.

1. **Very bright flashes** = possibly sunlight reflecting off satellite
2. **Extremely brilliant flashe**s = possibly "iridium flare" (caused by sunlight reflecting off the mirror finish of a certain type of satellite or its solar panels)

and planets (Jupiter, Mars, occasionally Saturn, and especially Venus[1]) prompt some eyewitnesses to insist their UFO "was too bright to be a star" (Hendry 1979, 24–31; see also Sheaffer 1980).

Airplanes. These frequently become UFOs, such as when seen head-on and so resemble a classic flying-saucer in edge view. Not only can aircraft seem to hover (as explained earlier), but they "are capable of performing side-to-side motions, climbing vertically, descending and changing direction abruptly." Also, rows of anti-collision lights on the wings, blinking sequentially, can give the impression that they—and the craft—are rotating.

Significantly, "One of the leading causes of surprise is the inability of the reporting witness to hear any noise from the aircraft." Indeed, "even low-flying aircraft like advertising planes [now scarce] have a 91 percent occurrence where no sound is ever heard by the reporting witness." Helicopters likewise often go unheard, and they are also capable of particular freedom of motion (Hendry 1979, 38, 40).

Meteors/Fireballs. A *meteor* is the flash of light from a stony or metallic celestial object that burns due to friction upon entering Earth's atmosphere; a *fireball* is a very bright meteor (brighter than Venus). Meteors may be seen any time of night—and fireballs day or night—during any part of the year. However, they are most likely to be seen during major meteor showers that occur on certain peak dates (give or take a few days): the Quadrantids (January 4), Perseids (August 12), and the Geminids (December 13). Notably, "since we are only viewing an apparent trajectory along our line of vision, any meteor/fireball can appear to adopt *any* direction and angle including upward, and it need not move in a curving path." Usually, the paths of meteors/fireballs (and of re-entry of space debris) are short and the duration measured in seconds (but as long as three minutes for re-entry objects). Few meteors/fireballs are heard (Hendry 1979, 41–44).

Balloons. Balloons are chameleons of the sky. A research balloon can achieve high altitudes and reach speeds of over 200 miles per hour (seeming to be faster if its size or altitude is misestimated). It can stop, seem to hover, move erratically, or execute sharp turns—depending on the winds. It can even appear to change shape and color. Depending on how sunlight strikes its surface, the balloon can appear to be white, metallic, red, glowing, and so on.

Moreover, as Martin Gardner observed (1957, 57–58):

> At a distance, a balloon loses entirely its three-dimensional spherical aspect. It takes on the appearance of a disc. From beneath, instruments hanging below the balloon's center, can easily be mistaken for a "hole," giving the disc the shape of a doughnut. If viewed from the side, the disc seems to be flying on edge, like a rolling wheel.

Others. While stars, aircraft, and meteors account for the greatest proportion of UFO reports, other phenomena also represent significant UFO impostors. These include those "nocturnal lights" UFOs subsequently identified as satellites, searchlights (playing on clouds), prank balloons, and others, including flares. Flares are not reported often as UFOs, but when they are they prompt some of the more sensational cases.[2] "Daylight disc" UFOs that subsequently become identified include weather balloons, aircraft, meteors, Venus (again), certain cloud effects, and even birds.

Radar anomalies were once common but of little evidential value due to the number of known natural causes for them. Such anomalous radar targets—called "angels"—have been eliminated by modern radar. However, they are still cited in older cases where they may be attributed to birds, smoke, dust clouds, areas of atmospheric turbulence—even reflecting layers in the atmosphere returning echoes of fixed or moving objects on the ground (Klass 1976, 208–210). Radar-visuals represent the supposed matching of a radar return and a sighting of a UFO, but once again investigation converts some of these UFOs to IFOs—prank balloons in some cases. False correlations have occurred in other instances, such as a supposed match between a scintillating star and a supposed radar return that was instead attributable to ground clutter (Hendry 1979, 70–71; for more on radars and UFOs, see Klass 1976, 207–219).

Although there are countless other potential UFOs, this discussion and accompanying chart should prove helpful as a first-look source in the identification process. ■

Notes

1. Venus can be eighty times brighter than surrounding stars and is most often seen in twilight (because the angular separation from the sun can never be greater than 47°).

2. See, for example, "The Stephenville Lights: What Actually Happened," Skeptical Inquirer, January/February 2009, 56–57. This represents a detailed investigation by James McGaha.

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Joe Nickell, PhD, is a skeptical UFOlogist and author of many articles on extraterrestrial visitation, a coeditor of *The UFO Invasion*, and contributor to *The Encyclopedia of Extraterrestrial Encounters*.

James McGaha, major, USAF retired, is a former special operations and electronic warfare pilot and now an astronomer and director of the Grasslands observatory in Tucson, Arizona.

UFOs: Why Humanoid Aliens? Why So Varied?

UFOlogy is replete with varying descriptions of UFOs and their occupants—so much so that concluding an alien intelligence is piloting them goes against the more logical and reasonable conclusion that the only intelligence behind the phenomenon is the human brain itself.

ERIC WOJCIECHOWSKI

Here's what we know: People report seeing things in the sky they cannot explain. Reported objects come in all shapes and sizes: saucers and triangles and cigar shapes and everything in between. Glowing orbs and rotating lights have been reported as well. Some people report encountering entities associated with these objects. They, too, come in all shapes and sizes, but most reports of the beings are anthropomorphic. Due to a lack of better explanation, some people conclude (despite all the differences) that there's a core truth here that the human race is not alone, that it's being visited or coexisting with an entity that appears to be so advanced and mysterious that it's nearly godlike. We don't know if the entities are extraterrestrials, interdimensional beings, or some combination thereof. They are, however, undoubtedly the greatest players of hide-and-seek the human race has ever encountered.

In the early days of UFOlogy, that of the 1940s, 1950s, and some decades later, the extraterrestrial hypothesis was the preferred explanation. But it never panned out; there never was a White House landing or equally clear public revelation. So UFOlogy evolved, only in the wrong direction. An intelligence was still assumed in play, and the search continued to explain what it was. Name your flavor of what it is and there's now a book, blog, or article trying to convince you of the author's preferred hypothesis: extraterrestrials, ultradimensionals, interdimensionals, and even demons bent on perverting Christians.

In an attempt to throw a larger fishing net to explain the diversity of the phenomenon, Jacques Vallee penned *Passport to Magonia* in 1969, cataloging stories similar to twentieth-century UFO encounters. Vallee showed that UFO reports go back as far as the oldest written records and

are just as varied as today. Sightings were interpreted differently depending on the culture, era, and all the other variables afforded by the time in history in which they occurred. Not only things in the skies but encounters with nonhuman beings were reported as well (Vallee 1993). Human history is filled with stories of demons, succubi, fairies, angels, leprechauns, Jinn, *ad infinitum*. *What they all have in common is they are all just stories.* This cannot be stressed enough. There is no evidence that passes scientific muster to conclude there really is an alien intelligence interacting with human beings.

Let's take the UFO occupants for starters. Joe Nickell's Alien Time Line (first published in the September/October 1997 Skeptical Inquirer) is a handy chart listing numerous types of reported nonhumans in chronological order of when they were seen. Most are anthropomorphic: a head, two arms, a midsection, and two legs. Some look like robots or a toaster. There's a big blue grasshopper, too (Nickell 1997). Based on just this, if we have a nonhuman intelligence piloting UFOs, it appears there's a lot of different species who managed to make contact but remain relatively hidden for whatever reason. The question has to be asked and answered: Is it likely different races *just happen to evolve* on different planets/dimensions to be anthropomorphic *and* these many races are able to get here *and* they all have chosen to stay out of human reach? What are the odds of this? Or are all the reported races better explained by a psychological explanation? Until we have real tangible evidence, a psychological explanation seems more realistic according to Occam's razor.

What of the fantastic machines? After ruling out balloons, airplanes, drones, and birds—after one concludes the UFO is an "other"—what then? How do we compare the saucer to the triangle? And what of the numerous kinds of saucers—fat, slim, wide, nearly ball shaped? How about the single orb of light to the many orbs of light? Are we to conclude numerous types of craft are being used by numerous species of aliens? Or is faulty human psychology a better explanation?

An intelligence was still assumed in play, and the search continued to explain what it was. Name your flavor of what it is and there's now a book, blog, or article trying to convince you of the author's preferred hypothesis.

In an attempt to explain the elusive nature of this intelligence, Greg Bishop (2017) uses a co-creation hypothesis. This hypothesis argues that UFO alien intelligence interacting with humanity is so alien that the human mind describes it the only way it can, which accounts for the varied sightings and encounters. This hypothesis fails in that it assumes there's an alien intelligence in the first place. The horse is before the cart.

Where Bishop is correct is the human mind is a key part of the phenomenon; that is, when it comes across something it cannot account for, it does its best. And since the human mind quite often sees purpose in random events and natural occurrences, it's hardly a surprise we have a history of fairies and demons and now, in our space age, the varied descriptions of extraterrestrials or interdimensional beings in their wondrous flying machines.

UFOlogy has an endless supply of anecdotal reports of unidentified things seen in the sky. There are also endless photographs and videos, many of which turn out to be hoaxes or are later identified. The logical fallacy occurs when the combination of all UFO reports that remain unidentified is attributed to a nonhuman intelligence as opposed to something else. It's one thing to see something in the sky you cannot identify; it's quite another to conclude after running through the possibilities that what you saw was of an intelligence yet to be defined by us. Even if you truly could rule out the mundane, can you seriously confirm intelligent alien control? The first thing we have to do before assuming there's an alien intelligence driving some UFOs is to verify there's an alien intelligence there at all. And most important, verify that it isn't in our own heads. The sheer number and diversity of sightings and encounters suggest human psychology is more in operation here than an objective phenomenon.

As I pondered this, Benjamin Radford's SI article "The Curious Question of Ghost Taxonomy" came to my attention, and its argument regarding ghosts is exactly what I was thinking regarding UFOs. Radford writes, "Over the years various attempts have been made to classify and categorize ghosts … usually according to eyewitness reports." And then he makes it clear anecdotal information is subject to human error and is unreliable. Radford continues, making the point throughout the article that there are so many defini-

tions with equal amounts of evidence as to pretty much make the whole subject useless. He writes, "Trying to classify inherently unknown entities whose very existence and nature remains unproven is a fool's errand: How many types of ghosts are there? As many as you want there to be" (Radford 2018).

Speaking particularly about cryptozoology but applicable to UFOlogy, geologist and investigator Sharon Hill notes:

> The primary problem … by and large [is they] assume that a mystery creature is out there for them to find. They begin with a bias … . They are not testing a hypothesis but instead seeking evidence to support their position … . They also begin with the wrong question. Instead of "what happened?" they ask "Is it a cryptid?" (Loxton and Prothero 2015)

I discussed this topic with Tyler Kokjohn, professor of microbiology at Midwestern University, who also publishes and contributes to articles critiquing alien abduction claims. He wrote to me in a July 5, 2018, email:

> Seeking confirmatory evidence for a position is not a sin; scientists champion hypotheses all the time. The problem here is that they never get any data or [they] interpret junk data in the most hopeful way. In science at some point no means no and is accepted as such. In ufology it is a signal to multiply hypotheses to explain failure.

Back to ghosts, Radford writes:

> Ghost reports and sightings can of course be catalogued, analyzed, and categorized, but ghosts themselves cannot. This is a basic mistake, confusing a type of *ghost* for a type of *ghost report*; they are not the same thing at all, and ghost hunters confuse the two at their peril. A ghost report is merely a record of something that someone—for whatever reason and under whatever circumstances—could not explain and chose to attribute to an unseen spirit and may or may not reflect an actual ghost appearance. (Radford 2018)

Change the word *ghost* to *UFO* in that above paragraph, and you have the current field of UFOlogy.

Radford concludes in his column that although ghost hunters are convinced ghosts exist, they still can't tell you what they are. The same applies to those who believe some UFOs are of extraterrestrial origin or are otherwise an "other" intelligence. What ghost hunters and UFO hunters have in common is both assume their unproven entity of choice is an intelligence. And they do so by the fallacy of arguing from ignorance.

UFO believers who have concluded there's an intelligence flying around have offered just as many properties on the ET as ghost hunters have on ghosts and the religious have on the old gods. I say this with purpose. UFOlogy operates very much like a religion. Absent real evidence of aliens and their machines, *faith* is the operating virtue of the believer. Why are they here? Why did they come? Why are they not more communicative? Any day now, a big enough sighting will come that everyone will have to acknowledge it. Disclosure is always expected but never comes. Aliens are preparing humanity for full contact that never comes. Chosen people are picked to spread their message. Aliens have replaced the angels. Aliens will help us solve (insert coming disaster here). If there's any evidence to Jung's archetypes, aliens and flying saucers are the space age imprints on them.

Human history is full of misunderstandings and wrong interpretations and in many cases is thought to have an amazing godlike intelligence acting on its behalf. Once it was thought the sun went around Earth due to the gods; the rain fell for the same reason, and the crops grew when they favored them. Disease struck when the gods were displeased, and mental illness was the work of a demon. And yet, time and again, these mysteries were found to have natural explanations. Attributing intelligence to mysterious, unidentifiable phenomena seems to be a very human thing to do. It is my conviction that it was only through the error of claiming to already know the answer that questions stopped being asked and it took longer than it should have to solve what is common knowledge today.

UFOlogists suffer from the same confirmation bias, arguing from ignorance, and the god of the gaps fallacies as ghost hunters, cryptid hunters, and religious types. They are all prone to draw conclusions that what they experienced was a nonhuman intelligence. In fact, the bottom line is probably more a very human intelligence that is much more faulty—and yet creative—than we give credit. ■

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Eric Wojciechowski writes essays and articles on politics, religion, pseudoscience, and woo. He is author of the UFO-themed novel *Chasing Disclosure*. Other published works can be found at *American Atheists* magazine, *Free Inquiry*, and *Skeptic* magazine. He wrote "Becoming Fantastic: Why Some People Embellish Their Already Accomplished Lives with Incredible Tales" in our November/December 2017 issue.

Those Supposed Aliens Might Be Worms

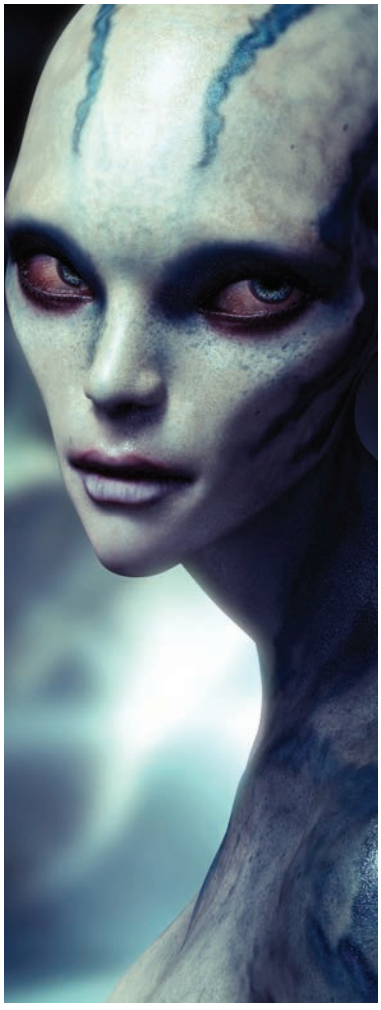
Many believe life on alien planets would likely include intelligent humanoids, and much of science fiction uses this idea. Based on what we know of evolution on Earth, there is really no basis for this belief; however, one supportable prediction for alien lifeform would be worms.

DAVID ZEIGLER

"There is nothing in natural selection that allows you to predict any particular pattern that it might generate." —Henry Gee

"Life is not oriented towards increasing complexity, nor is it fated to become ever more complex." —Alexandre Meinesz

When most people hear the word aliens, as in life from other worlds, they immediately picture something that is strongly humanoid—upright, two legs, two arms, a trunk, one head, two eyes, etc. This limited line of imagination is almost totally due to science fiction writers and filmmakers. There is absolutely no scientific reason to assume that the humanoid form is a probable outcome for evolution on another planet, and highly intelligent humanoids are even less probable. Though it has obviously come about here on Earth, it certainly didn't have to happen—it was just one of countless millions of possibilities that chanced to materialize from Earth's evolutionary process.



In another article (Zeigler 2008), I argued from a biological perspective that intelligent humanoids were but one of many unlikely possibilities. In that article I also ventured some predictions of what we might expect to find in terms of life on another planet. These were mostly very general predictions such as photosynthetic organisms, predators, parasites, and so on. I did not then attempt any prediction of what those forms might have looked like, though my major argument was that to expect anything like a humanoid form would be a long shot at best.

Having thought more about that point (perhaps prodded by the inane History Channel series *Ancient Aliens*), I decided that if I were to venture any prediction of form for any supposed aliens, it might well be that of worms. Of course, the safer bet would be microbes, especially photosynthetic or chemosynthetic microbes. The first lifeforms in any evolutionary process would most likely be simple microbes of some type, and after any abiotically formed "soup" was exhausted as a fuel source,

some of those microbes would have to evolve some way of producing energy-containing compounds (fuel) using either sunlight (photosynthesis) or chemical processes (chemosynthesis). Microbes, then, are the surest bet.

Beyond microbes, if any multicellular forms with three or more cell types evolved, and if those forms did not synthesize their own fuel (were *heterotrophic*, in scientific terms), we might roughly refer to those forms as animals, especially if some of them had powers of locomotion. So what might alien "animals" look like? The real answer is that we have no idea and will likely never know since this would most likely require the exploration of far distant solar systems—something extremely unlikely to occur, no matter how much some physicists talk about *worm*holes in space (pun not intended).

A far more likely (than humanoid) possibility for alien life would be something we would recognize as a worm. I will have to be a bit technical and use some names and terms most readers will be unfamiliar with but can easily look up if clarification is needed. Let me start by pointing out that out of an approximately 10,000,000 living species (and this is a conservative number) and close to a billion species to have ever lived on this planet, only one has achieved humanoid form and advanced intelligence. Throw in chimps, gorillas, and the few other apes if you feel so inclined, but that still only comes to half a dozen or so such species, and of course these are all closely related recent forms that descended from one common ancestral species, which itself might easily not have evolved at all.

Worms would be a far more likely bet based on what we know of earthly life. And what other source can we draw from? Why worms? A general rule of thumb in evolution (not without exceptions) is that simple forms precede complex forms, at least in the initial stages of evolution. Worms are the simplest animals with an anterior end and a right and left side, something the simpler sponges and jellyfish lack. The Animal Kingdom is now divided into some thirty-plus major divisions called phyla. Humans are in the Phylum Chordata along with all other vertebrates, most of which are fish, as well as some invertebrates such as sea squirts and lancelets—technically no worms here, though later I will mention some Chordates that did evolve elongated limbless bodies. But of the other phyla, a surprising number contain either all worm forms or at least some worm forms.

A far more likely (than humanoid) possibility for alien life would be something we would recognize as a worm.

An animal phylum is a grouping that includes all the animal species in one very old line of descent, going back in time to the very beginnings of the animal kingdom in the Precambrian era (more than 540 million years ago). In short, these very old lines of descent separated early from all other lines and have remained separate from other lines for almost the entire known history of animal life on the planet. For my argument, this simply means that not all worms are the same thing, not even close. You are more closely related to a goldfish (both Chordates) than an earthworm (Phylum Annelida) is to a nematode worm (Phylum Nematoda).

We may never know with complete confidence what the first animals were. Much evidence points to sponges, some to comb jellies and cnidarians, and some to creatures such as placozoans, a still surviving group of very small and simple animals. None of these groups are worm groups, so apparently worms of all sorts may have arisen from non-worm groups. There are some trace fossils that appear to be tiny fossilized burrows dating back into the Precambrian, and at least some of these burrows may have housed worms of some type, though the small soft-bodied worms did not themselves fossilize. At any rate, worms did appear very early in the history of animal life, and by the time of the Burgess Shale fauna (515 million years ago) several distinct worm phyla were present. Today, some worms can swim in open water, and some can crawl on land or aquatic bottoms, while a great many, such as the common earthworm, burrow in sediments or soil. If life has evolved on some distant planet, that planet most likely has liquid water, and where you find abundant water you would expect

to find bottom muds, as in the great expanses of the abyssal plains in our ocean basins—a perfect worm habitat.

Here on Earth, worms evolved independently several times and have adapted to almost all environments. There are as yet no flying worms, but there are worms in the soil, worms in freshwater, worms in our oceans, and vast hordes of parasitic worms within their host animals and plants. Some worms have adapted to the hellish temperatures of undersea hydrothermal vents, while others live in methane ice deposits deep in the Gulf of Mexico. Some inhabit regular sea ice near the poles. While the wildly diverse insects make up the majority of Earth's species, if it were not for those familiar six-legged creatures, worms of all types would make up around half of all animal species. To get on with my point in as brief a summary as possible, I will resort to a list:

1. The segmented worms (Annelida) include earthworms, leeches, and a huge diversity of marine species. It is now known that Annelids are close relatives of Molluscs, though whether the ancestor of the phylum Annelida was wormlike is as yet unknown.

2. The Nematode worms (Nematoda), perhaps the most diverse worm phylum and sister group to yet another phylum of worms, the Nematomorphans.

3. The flatworms (Phylum Platyhelminthes), including free-living forms and diverse parasitic worms such as the flukes and tapeworms. Flatworms were once thought to be a group ancestral to many of the other animal phyla. Now they are viewed as a more recently derived group that may have simplified body plans in comparison to those of their ancestral line.

4. The ribbon worms (Phylum Nemertea), another distinctly different and ancient phylum of marine worms.

5. The marine Parapulid worms (Phylum Parapulida), perhaps the least changed worms known, with fossil parapulids from the famed Burgess Shale strongly resembling some modern species.

6. The velvet worms (Phylum Onychophora). This once marine group is today represented by a small number of tropical terrestrial species.

Here on Earth, worms evolved independently several times and have adapted to almost all environments. There are as yet no flying worms, but they are in the soil, freshwater, and our oceans.

7. The Rhombozoans, a separate and unique group of marine worm forms that are parasites of cephalopods, such as the octopus and squid. Notably, these tiny worms are the simplest known animals, with the fewest cells and the fewest cell types of any other kind of animal. They may well have simplified their body plan in adapting to parasitism from a once free-living ancestor.

8. The acorn worms (Phylum Hemichordata). These marine worms make up a portion of their phylum that is shared by strange little animals called pterobranchs. They too appear to represent a separate origin of the worm form.

There are several more animal phyla containing worms, but I need to move on to another point. In addition to the many separate phyla of worms, there are several other animal phyla within which worm forms have evolved. Acanthocephalans are parasitic worms once believed to be a separate phylum but now known to

be derived from rotifers, which are not worms (Phylum Rotifera)—so again, a separate evolution of worms. Pentastomids are parasitic worms also once thought to be a separate phylum but now known to be a type of Crustacean (Phylum Arthropoda) highly modified and changed from the typical crustacean morphology. Several insect groups (also Arthropods) have evolved complex life cycles that include body forms that could at least be construed as wormlike—the caterpillars, grubs, and maggots for example. There is one group of bivalves (phylum Mollusca) known as the shipworms that burrow into wood, and they at least look wormlike—thus the name. All the general facts about worm groups stated to this point can be found in Nielsen (2012) and/or Brusca et al. (2016).

Collectively, our planet's "worms" have converged on their body form from many distinct ancestral groups, some of which we know were not wormlike.

There is one group of snakes called the worm snakes that have evolved to look much like earthworms, except that they have tiny eyes and jaws. Snakes themselves roughly resemble worms, and they evolved from lizards. As well, several other lizard groups have lost their legs (including glass lizards and some skinks) and evolved into elongate, legless forms. A group of amphibians known as the Caecilians have likewise lost their legs and evolved into forms resembling giant earthworms, complete with a burrowing lifestyle. In the marine phylum Echinodermata, a few sea cucumbers have become greatly elongated and undulate across the bottom in a wormlike fashion. Though they do have short legs, millipedes much resemble worms. Small eels resemble worms. The slugs and some nudibranchs of the phylum Mollusca at least come close to wormlike in form.

In short, the worm form body has evolved a great many times here on Earth, with many of the major worm groups having been around since the dawn of the animal kingdom. Collectively worms have diversified into at least a few million species. The worm form appears to be well adapted to many of the planet's environments and can display almost every available lifestyle, including predators, herbivores, scavengers, parasites, filter feeders, etc. Though they are not all the same kind of animal, "worms" have collectively been hugely successful on this planet.

This evidence from our planet shows that worms have arisen independently many times. This evolutionary convergence on the worm form from many different ancestral groups at least suggests that worms might be a likely lifeform on other life-bearing planets. Simon Conway Morris has tried to use convergence as his main support of the idea that humanoids would be likely on other planets (Morris 2003). Without going into them, I find his arguments for the inevitability of humanoids to be fatally flawed. Much of his book consists of good examples of true evolutionary convergence, but he then strangely argues from convergence that sentient humanlike creatures should arise on other planets. He is mistaken to think that this assumption can be argued from convergence because humans are not convergent with any other species on Earth in either form or intelligence. We represent a single origin, while worms represent a great many separate origins. Humans are vertebrates, and the vertebrate group had a single origin in evolution within a single phylum of animals. Humans are mammals, then primates, and apes, and finally humanoids, and each of these increasingly specific groups had but a single evolutionary origin (that need not have occurred). There is simply no valid argument from convergence for the proposition that life on other planets will evolve humanoids with our level of intelligence. As others have pointed out, and as is clear from the wording in his book, Morris is undoubtedly biased in his argument due to his religious beliefs and his belief that there is purpose and meaning in the universe—including our own evolution.

To sum up, none of our pertinent evolutionary ancestry illustrates convergence of two or more groups or lines—rather our ancestry is one of consecutive single origins. Collectively, our planet's "worms" have converged on their body form from many distinct ancestral groups, some of which we know were not wormlike. This does suggest, if we are to use evolutionary convergence as a guide, that at least some of those possible aliens out there might indeed resemble worms, and I doubt that worms could ever build a flying saucer or develop the technology to send and receive radio waves. Those who continue to hold that intelligent humanoids are a good bet for alien body forms simply don't understand evolution very well and certainly don't understand the vastness of the diversity of species that have lived, and that now live, on our home planet. If they did, they would clearly recognize that we humans are a single and unlikely latecomer, and our mere presence cannot be taken as evidence to support an argument for similar forms on other planets. ■

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David Zeigler is a retired professor of biology. He received his PhD from the University of North Texas and is the author of the book *Evolution: Components and Mechanisms* (Academic Press, 2014). He wrote "In What Version of Evolution Do You Believe?" in our January/February 2018 issue.

Arthur J. Cramp: The Quackbuster Who Professionalized American Medicine

How a pioneering physician at the American Medical Association fought medical fraud on a national scale in the early twentieth century.

ROBERT BLASKIEWICZ AND MIKE JARSULIC

In the first decade of the twentieth century, an enterprising man in Grand Rapids, Michigan, named A.W. Van Bysterveld claimed that he could "locate the cause of your aches and pains" for free via the mail, if only you would send him a vial of your urine. Van Bysterveld was a self-proclaimed "Expert Inspector of Urine" and claimed that he used a "secret process handed down generation after generation, and most carefully guarded by the old families of Europe." Van Bysterveld assured prospective clients that though his "secret methods are not taught in schools," he "examines on an average of 25,000 bottles of urine a year. This alone stamps him as an authority of exceptional qualifications" (Cramp 1911a, 56).

Arthur J. Cramp, MD (photo courtesy of the American Medical Association).

Between March and November 1910, the American Medical Association's (AMA) Propaganda for Reform Department, led by Dr. Arthur J. Cramp, investigated Van Bysterveld's claims. A sample (containing tap water, pepsin, aniline dye, and ammonia) prepared by the chemists at the AMA was sent to the Van Bysterveld Medicine Company. The diagnosis came back: "Careful examination of the urine shows there is too much acid in the blood, which will cause a rheumatic condition, the back is weak, and you will have a tired nervous feeling most of the time" (Cramp 1911a, 56). Meanwhile, correspondents working with Cramp in Iowa and Michigan contacted Van Bysterveld's company and sent in samples that were identical to the first vial from the AMA. This time, the mixture in one case indicated poor blood, a malfunctioning liver, gas, nervousness, and heart problems; in the other case, it indicated weakened kidneys, a "catarrhal condition [inflammation of mucosal membranes] of the stomach and bowels," and nervousness (Cramp 1911a, 56–57).

Lastly, two more samples were sent in from different addresses in Chicago. This time, both vials were filled with 95 percent tap water with 5 percent glucose. This would indicate that the patient was not merely diabetic but was urinating a substance with more than twice the sugar content of a Red Bull. Again, the diagnoses came back as either liver disease or a catarrhal digestive track. Cramp's conclusion was unequivocal: "The whole things shows conclusively that the 'examination' of the urine is a farce, the diagnosis is a fake, and taking the money from victims for the 'treatment' of a purely imaginary disease is a fraud and a swindle" (Cramp 1911a, 57). Cramp further condemned those who profited from this mail-order pseudomedical company: "Those publications which accept the advertisements of this concern are, wittingly or unwittingly, participating in the profits of scoundralism" (Cramp 1911a, 57).

Arthur J. Cramp, MD, played an outsized but oddly unacknowledged role in the professionalization of American medicine. American medicine after the Civil War was still unorganized and largely unregulated. Practitioners needed little formal education and no single commonsense, science-based standard of evidence for treatments applied. As a result, numerous competing schools of thought and private interests fought for the attention of the American con-

sumer, who was barraged with advertisements for nostrums and cures on nearly every page of every popular periodical. The American Medical Association, founded in 1847, had always looked down on secret proprietary treatments, and it saw as an important part of its mission the suppression of quack medicine. For instance, Eric W. Boyle notes that the AMA reserved the right to refuse admittance of journals that advertised proprietary medicines into the Association of Medical Journal Editors, a group that had been established by the AMA to raise the standards of medical publications. Nonetheless, the revenue generated by advertising questionable remedies was so substantial that even the *Journal of the American Medical Association* (*JAMA*) failed to uphold its own standards until the turn of the twentieth century (Boyle 2013, 12–3). Dr. Cramp contributed to the professionalization of American medicine by identifying and exposing quackery;

Arthur J. Cramp, MD, played an outsized but oddly unacknowledged role in the professionalization of American medicine.

subjecting claimed remedies to scientific analysis; assisting government, public, and professional policing efforts directed at controlling health fraud; and pursuing an aggressive thirty-five–year public education program.

Arthur J. Cramp was born in London on September 10, 1872. According to British public records, his father was a blacksmith, and at the age of sixteen, Cramp was apparently an engineer's apprentice. He moved to the United States at twenty. According to an undated biographical blurb in the files of the AMA, Cramp "did farm work in Missouri for a few years, attended an academy in that state. And then taught in a country school, at the same time writing a weekly column in the local newspaper" (Cramp, Arthur J, Special Data, n.d.). He married a woman from Missouri named Lillian Torrey. Cramp's family eventually settled in Waukesha, Wisconsin, where he and his wife worked at the Wisconsin Industrial School for Boys, a reformatory high school. According to the 1900 census records, they lived on the campus where they worked. Long before he became a quackbuster, then, he was an educator, and that ethos informed his later work. While at the school, they had a daughter, Torrey, who died a little over a year later. According to her death record, Torrey died January 2, 1900, from seizures related to meningitis. According to a letter from a colleague at the AMA to the historian of American quackery, James Harvey Young, Torrey's death while being treated by a quack is what compelled Cramp to pursue medicine and expose quackery. (It should be noted, however, no effective treatments for communicable meningitis existed at the time.) In 1906, Cramp graduated from the Wisconsin College of Physicians and Surgeons and joined the American Medical Association (Cramp, Arthur J., Correspondence, n.d.) as a medical editor in December of that year.

Cramp joined the AMA at a particularly auspicious time for practitioners who sought to combat quackery, as the country was in the middle of a period of progressive reforms. In 1905, the year before Cramp was hired, the AMA established the Council on Pharmacy and Chemistry, an in-house lab that analyzed the contents of patent medicines. That same year, Samuel Hopkins Adams published a series in *Collier's* that would be collected in an edition called *The Great American Fraud*, a monumental and damning exposé of modern medical charlatanry. Adams named names of fake practitioners, revealed the alcohol and narcotic content of supposed cures, and laid bare the profitable codependence of nostrum advertisers and publishers. In 1906, Upton Sinclair published *The Jungle*, a novel based on his observations of appalling and dangerous conditions in Chicago's meatpacking industry.

All of this occurred at the same time a pure food and drugs bill was moving through the Congress. The Pure Food and Drugs Act of 1906 regulated claims that were made on drug packaging, but in 1911 it was interpreted by the Supreme Court very narrowly to mean only that the ingredients on the label needed to be accurate. Claims of effectiveness remained unregulated. The 1912 Sherley Amendment was introduced to close this loophole, but during the legislative negotiations language regulating "false or misleading" claims was replaced by "false and fraudulent," which introduced the question of intent into legal matters, a more difficult case for regulators to prove (Cramp 1924, 424–425).

In 1910, the Carnegie Foundation released what was known as the Flexner Report, a comprehensive survey of medical education in the United States and Canada. The report led to reforms that standardized medical education, established scientific medicine as the educational gold standard, and diverted educational resources and accreditation away from homeopathic, proprietary, botanical, and eclectic medical schools (Page and Baranchuk 2010, 74). All these developments informed and validated the AMA's work of shedding light on proprietary medicines and quackery through aggressive public education, a campaign in which Cramp would feature prominently.

Even though the Pure Food and Drugs Act staked out new territory in the government's interest in public health, few federal resources were available to regulate medicine; each state had (and still has) its own medical board and standards of practice. As such, the AMA as a national organization was one of the few institutions that could conceivably standardize the practice of medicine. Cramp thought the AMA was taking on a job that should in theory be done by the government; however,

> the exigencies of politics make it well-nigh impossible for health agencies to tell unpleasant truths when these involve huge vested interests. Nevertheless, if the public's health is to be served, these truths must be told. The medical profession of America, recognizing this fact has assumed this

> responsibility and is discharging it through the Bureau of Investigation. (Cramp 1933, 54)

The American Medical Association, as part of its attempt to promote the interests of its members, became, in the words of Eric W. Boyle, "the primary arbiter in disputes over the legitimacy of medical therapies" (Boyle 2013, 62). This aspect of the professionalization of American medicine was achieved largely through the efforts of Arthur J. Cramp. As soon as Cramp was hired on as an editor of the *Journal of the American Medical Association*, he began contributing regular pieces about quackery to it. As part of the general push to improve the quality of medical information available to physicians and the public, the AMA established the Propaganda for Reform Department, which grew out of the Council on Pharmacy and Chemistry and was headed by Cramp (Cramp 1933, 51). Cramp believed in what he once called "public education through publicity" (Cramp 1920, 788), and he believed that "the best that the medical profession can do in protecting the public is to turn the light on the methods of the faddist and the quack, so that his ignorance or fraud becomes apparent" (Cramp 1927b, 727–728). This was the mission of the Propaganda for Reform Department, which became the Bureau of Investigation in 1925 and the Department of Investigation in 1958 (Hafner et al. 1992, viii).

The centerpiece of the Propaganda Department was a growing collection of materials related to quackery. The collection grew out of information from Cramp's prodigious correspondence with professionals and members of the public who queried the AMA for information about a variety of treatments, practices, and practitioners that they encountered. Between 1918 and 1930, the number of letters answered by Cramp's office ballooned from under two thousand inquiries per year to over twelve thousand a year (Boyle 2013, 79). A fairly typical example of how this collection grew bit by bit can be seen in the file for a treatment called "Spray-O-Zone." In 1925, Cramp received a query letter from Francis E. Fronczak, Buffalo, New York's Public Health Commissioner. Fronczak asked for any information the AMA had on Spray-O-Zone, a nighttime nasal spray that claimed to "protect your children from infantile paralysis [polio]," and he included a sample of the nostrum in its packaging. On October 9, 1925, Cramp replied to the query:

> Your letter of September 23 was received in due course as was also the specimen of "Spray-O-Zone". As we had no record of Spray-O-Zone and had received no inquiries whatever about it, we were not justified in going to any large amount of work in investigating the nostrum. We did, however, ask the A.M.A. Chemical Laboratory to make a preliminary examination of the product. (Spray-O-Zone, 1925–1927)

He quotes the lab report, in which the chemists suggest that Spray-O-Zone was borax and potassium nitrate dissolved in water. A synopsis of the cursory qualitative evaluation of Spray-O-Zone appeared in the February 12, 1927, edition of the *Journal of the American Medical Association* (Cramp 1927a, 501). All of these items, and the packaging material, are preserved in the Spray-O-Zone folder. Through thousands and thousands of similar exchanges with physicians, regulators, and members of the public, Cramp steadily amassed a vast arsenal of information to unleash against medical hucksters and their enablers. Within five years of arriving at the AMA, according to historian James Harvey Young, "Cramp's office contained over 12,000 cards in a 'Fake File,' listing products, firms, and names of promoters. His 'Testimonial File' held the names of over 13,000 American and 3,000 foreign doctors who had given testimonials for proprietary drugs" (Young 1967, 131–2). By 1937, this card catalogue had expanded to some 300,000 entries (Boyle 2013, 80). Eventually, the collection would grow to 3,500 files spread over some ten thousand folders, totalling 370 cubic feet of material, or, as the archivists who described and catalogued the entire collection put it the 1990s, 185 standard file drawers (Hafner et al. 1992, x).

Long before Cramp became a quackbuster, he was an educator, and that ethos informed his later work.

Cramp made extensive use of this collection during his time at the AMA. He wrote a weekly column in *JAMA*, where he put the extraordinary medical claims to scrutiny, and he contributed the occasional article to H.L. Mencken's *American Mercury* magazine and the AMA's popular health magazine, *Hygeia*, for which he was an advisor (Fishbein 1969, 132). Not only did he investigate the products and quacks, but he also looked into the histories of the people involved, gathered information about their business plan, fact-checked advertisements, discussed the reasons that quacks were so convincing, and generally pulled back the curtain of a type of medicine grounded in marketing rather than science.

Among Cramp's other duties, he answered thousands of letters written to the AMA by laymen, Better Business Bureaus, and the advertising managers of publications that vetted ads they printed (Cramp 1933, 52). His department also supplied services that members of the public sought from government agencies, for instance, handling queries about questionable medical claims, products, and services that had been redirected to the AMA by local, state, and federal authorities. The AMA answered questions from government authorities seeking information about questionable medical practices that had appeared in their jurisdictions, and, said Cramp, "[played] an important part in bringing to the attention of state and federal officials schemes and methods that seem to be a menace to the public health, a violation of the law, or both" (Cramp 1933, 53). Starting in 1912, the Bureau

also published educational materials, including posters, slide shows, and offprints of Cramp's *JAMA* articles about different forms of quackery. Much of that material, in turn, was gathered into Cramp's three volumes of *Nostrums and Quackery*, which he described as "a veritable encyclopedia on the nostrum evil and quackery" (Cramp 1933, 51–53). These were published between 1911 and 1936. Cramp was so central to the fight against quackery in the early twentieth century, Young remarks, that "scarcely an investigation was launched by a regulatory agency but that an inquiry went to Cramp to see what information the AMA already had on hand" (Young 1967, 132).

One of the challenges that dogged Cramp throughout his career was lax advertising standards. Though the Pure Food and Drug Act regulated what could be said on drug packaging, it did nothing to regulate advertisements and marketing of drugs elsewhere. Cramp knew that he was fighting an uphill battle as long as patent medicine manufacturers were able to market directly to potential consumers. His critiques of nostrum advertisements tended to focus on a few themes. First is the use of "selling copy," which sought to plant a need for a product in the minds of a target audience rather than indicating where products for a preexisting need could be found.

Fresh Family Medicines.

THE subscriber having received his Fall and Winter Stock of Drugs, Chemicals, Patent Medicines &c. has on hand a full and fresh supply of the following, viz :

Jayne's Expectorant ;	Jayne's Alterative ;
Tarrant's Cordial Elixir of Turkey Rhubarb.	" Carminative ;
Tarrant's Seltzer Aperient ;	" Tonic Vermifuge ;
Rowand's Tonic Mixture ;	Louden's Female Elixir ;
Moffat's Phœnix Bitters ;	" Indian Expector'nt
Radway's Ready Relief ;	" Comp. Alterative ;
Roger's Liverwort and Tar ;	" Carminative Balsam ;
Ayer's Cherry Pectoral ;	" Tonic Vermifuge
Epping's Sarsaparilla and Queen's Delight :	Jayne's Sanative Pills ;
Dr. Allen's Compound ;	" Fever and Ague Pills
Guysott's Yellow Dock and Sarsaparilla :	Moffat's Life "
Wistar's Balsam ;	Leidy's Blood "
Davis' Pain Killer ;	" Female monthly "
Sand's Sarsaparilla ;	Brandreth's "
McAllister's Ointment,	Lee's and Spencer's "
Harrison's do	Gray's Ointment ;
	Cod Liver Oil, &c.,

With almost every article usually kept in a Drug Store, and to which he invites the attention of his friends and customers and the public generally.

Z. J. DEHAY.

Oct. 21. 83 tf

Cramp lamented the passing of this older type of advertising, which merely listed available products, as well as the rise of "selling copy," which created a false need for medicine in prospective consumers ("Fresh family medicines" 1851).

In practice, ads for quack remedies were intended to convince members of the public that they were sick with a particular condition, a sort of unethical, induced hypochondria. "No man," Cramp argued, "has any moral right to so advertise as to make well persons think they are sick and sick persons to think they are very sick. Such advertising is an offence against the public health" (Cramp 1918, 757). He roundly condemned "such periodicals and newspapers as are not above sharing the blood-money" of quack remedies (Cramp 1911b, 134). He saw these periodicals as enabling especially cruel fraudsters, or as he described them, "The swindler who sells stock in bogus companies to presumably intelligent human beings is a gentleman compared with those scoundrels who lie to the sick, humbug the suffering and fraudulently take the money of the incapacitated" (Cramp 1911a, 56).

Second, while other forms of merchandise that did not perform their advertised function or purpose would quickly be found out, fake medicine conspired with nature to trick patients into believing that fake treatments worked:

> The healing power of nature … is such, fortunate for biologic perpetuity, that the general tendency of the disordered animal economy is to get well. … In probably eighty per cent of all human ailments the afflicted person gets well whether he does something for his indisposition or does nothing for it. Herein lies the opportunity of the quack and the nostrum vendor. (Cramp 1924, 423)

He lamented the same difficulty modern quackbusters have in convincing the already committed that they are wrong and notes the power of the post hoc fallacy, which allows patients to mistake "sequence for effect" (Cramp 1918, 756).

Cramp also despised the use of testimonials in advertising, knowing how misleading they could be. Cramp's fights against testimonials were some of his most devastating attacks on quacks' credibility. A 1913 investigation into a supposed tuberculosis cure called Pulmonol is a case in point.

> The testimonial-givers are, as always, divided into two classes; those who really had tuberculosis and those who did not have it. As we have said many times, it is useless to investigate fresh testimonials. Most of them are written in good faith and not until the cases have progressed further are the victims undeceived as to the efficiency of the nostrum. It is therefore necessary to wait a year or two before looking into testimonials of this class. We then find, invariably, that the consumptive who had relied on the nostrum is dead. (Cramp 1913, 1998)

Cramp then lists nine patients who had provided testimony on behalf of Pulmonal that had appeared either in newspapers or in advertising pamphlets. Cramp had statements from patients' physicians and some of the patients themselves, and, as so often was the case, he often found that the patients had either never been sick (if they existed in the first place), had self-diagnosed their disease, were still sick, or had died of the ailment they thought they had beaten (Cramp 1913, 1998–1999). When possible, Cramp would juxtapose a patient's testimonial with their obituary, as was possible when "Sargon," a preparation that was 18 percent alcohol, placed an ad in the *Rochester Democrat and Chronicle* featuring JR Kimber's testimony on June 25, 1930, five days after the same paper had announced his death (Cramp 1930, 285). Especially vexing to Cramp was that the Pure Food and Drugs Act regulated claims made only on packaging, not the claims made elsewhere. He used this fact to suggest a clever way that the public could check the magnitude of nostrum makers' false claims: "One can with almost mathematical accuracy determine the falsity of modern 'patent medicine' advertising: Subtract the claims made on the trade package from those made elsewhere; what remains—and the residuum will be large—is falsehood!" (Cramp 1920, 788).

Another important aspect of Cramp's educational project at the AMA was to give public lectures to schools, professional groups, and civic organizations across the country. He gave talks on subjects such as "Patent Medicine and the Public Health," "Pink Pills and Panaceas," "Fighting Deafness Quackery," and "Objectionable Medical Advertising." The AMA did not charge for Cramp's appearances (they only asked that a projector be available for his slides). During the early 1930s, Cramp was giving dozens of talks a year.

In June 1934, Cramp was in Cleveland attending the AMA's annual conference when he suffered a debilitating heart attack from which he never fully recovered. He was bedridden for several weeks following the episode, and when he returned to work, he tired very easily and was unable to keep his former pace. As a result, he canceled numerous presentations and took a drastically reduced workload. As he explained in a letter dated January 1935, turning down an offer to give a presentation in St. Clair County, Missouri:

> Last June, on the day I reached Cleveland for the annual meeting, I came down with a coronary thrombosis that kept me in the hospital for nearly six weeks and kept me away from my work for over four months. I am still able to work only at a very greatly diminished tempo and as avoiding all evening talks. As a matter of fact, I turned down some talks right here in Chicago because they were to be given in the evening. (Cramp, Arthur J., Correspondence)

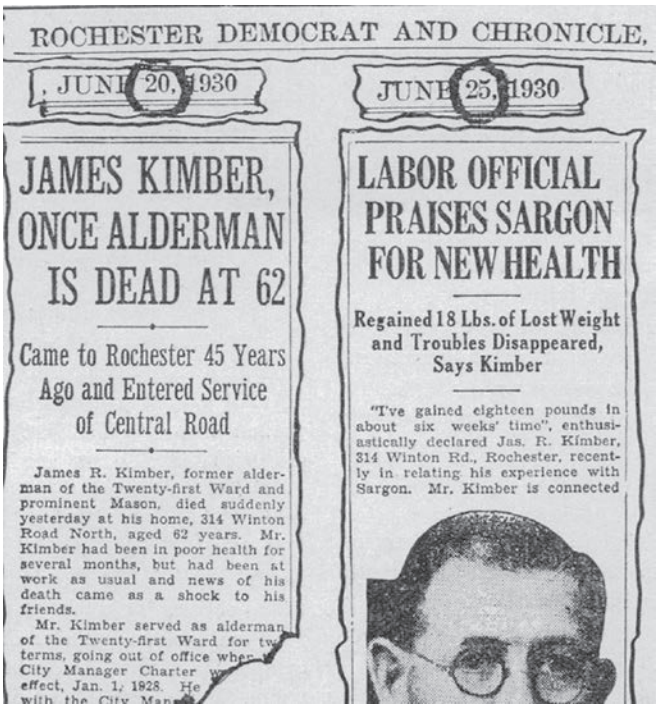
Cramp pulled back the curtain of a type of medicine grounded in marketing rather than science.

By September of 1935, the frustrating limitations that Cramp's heart attack placed on him prompted him to retire prematurely. In a letter dated September 24, 1935, Cramp explained:

> I have found that it is impossible for me to keep up my work here at the A.M.A. headquarters, and I expect in a few weeks' time (the end of November) to give up my work entirely. I had hoped to be able to stick it out until the end of November of next year, when I should have completed thirty years of continuous service, but I find that is impossible. ("Cramp, Arthur J., Correspondence")

In his retirement, he moved to Fort Lauderdale and then to North Carolina. After he retired, he still corresponded with the AMA and his editor Morris Fishbein, and he completed and published the third and final volume of *Nostrums and Quackery*.

Only one detailed description of Cramp's personality seems to exist, from W.W. Bauer, Cramp's colleague at the AMA during his final years with the organization, who was responding to an inquiry from the historian James Harvey Young. Bauer, who directed the AMA's Bureau of Health and Public Instruction, gave details that one would scarcely be able to perceive in Cramp's publications and correspondence. Bauer reported that Cramp was "typical of the small, slight Englishman. He was slender, quick, and birdlike in his movements with ruddy cheeks, clear blue eyes, [had] a small clipped mustache, and an imperial. In his later years, his hair and whiskers grew white." Cramp was a "perfectionist," and this trait characterized both his work and his personal habits. "He was always perfectly groomed and meticulously dressed," said Bauer. "He never sat down on a chair without first running his fingers over it to be sure there was no dust. He was also particular about his food and might be called a true gourmet. He ordered the best of food and usually in considerable variety and fairly large quantity, but he ate only a little of each. He usually had a bottle of imported ale with a meal and only took a few sips." Bauer said Cramp's home life was "devoted to reading and study" (Cramp, Arthur J., Correspondence, n.d.). Cramp was a cultured man and was a member of the Chicago Literary Club and the Chicago Ornithology Society, as well as numerous medical associations. Cramp wrote with a sharp wit and keen sense of the absurd, and he kept a copy of Lewis Carroll's works by his desk to get in the proper mindset to write about the absurdities he was fighting (Young 1967, 132). In an article about quack treatments that had received U.S. patents, Cramp singled out a concoction patented in 1913 by (the late) Alois Viquerat that claimed:


ROCHESTER DEMOCRAT AND CHRONICLE,

JUNE 20, 1930

JAMES KIMBER, ONCE ALDERMAN IS DEAD AT 62

Came to Rochester 45 Years Ago and Entered Service of Central Road

James R. Kimber, former alderman of the Twenty-first Ward and prominent Mason, died suddenly yesterday at his home, 314 Winton Road North, aged 62 years. Mr. Kimber had been in poor health for several months, but had been at work as usual and news of his death came as a shock to his friends.

Mr. Kimber served as alderman of the Twenty-first Ward for two terms, going out of office when City Manager Charter went into effect, Jan. 1, 1928. He with the City Man-

JUNE 25, 1930

LABOR OFFICIAL PRAISES SARGON FOR NEW HEALTH

Regained 18 Lbs. of Lost Weight and Troubles Disappeared, Says Kimber

"I've gained eighteen pounds in about six weeks' time", enthusiastically declared Jas. R. Kimber, 314 Winton Rd., Rochester, recently in relating his experience with Sargon. Mr. Kimber is connected

Another satisfied customer? (photo courtesy of the American Medical Association)

> The present invention relates to a composition which is intended to be used internally and which confers to the organisms immunity against the following microbial infectious illnesses: diphtheria, pneumonia, typhus, scarlet fever, influenza, septic infections, cerebral-spinal meningitis, syph-

ilis, pest, cholera and tuberculosis; it is also effective in another kind of disease, viz. goiter." (Viquerat 1913)

Cramp wryly noted, "By the time the patent was granted the inventor was dead and his estate got it. Since, by the use of his own preparation he should have been immune to practically all diseases, he probably died of senility" (Cramp 1926, 191–192). His colleagues at the AMA joked that quacks "had been pursued into the beyond by Doctor Cramp and his unrelenting ridicule" (Cramp, Arthur J., Correspondence).

Cramp wrote with a sharp wit and keen sense of the absurd, and he kept a copy of Lewis Carroll's works by his desk to get in the proper mindset to write about the absurdities he was fighting.

Dr. Cramp died at the age of seventy-nine, in Hendersonville, North Carolina, on November 25, 1951, according to his obituary in *JAMA*, of arteriosclerosis and urema. The editors remembered him as a "prolific and constant contributor to the *Journal*, and a pioneer in the fight against quackery and fraud in the healing arts" ("Deaths" 1951, 1773). The legacy he left behind was well expressed in an earlier review of his *Nostrums and Quackery* series in the *British Medical Journal*:

> All volumes have been compiled by Dr. Cramp, who for thirty years has led the struggle against heartless fraud. This is a fine record of courageous persistence in public service. The persistence is all the more remarkable because the struggle is endless. … Whenever a fraud is exposed half a dozen new ones spring up to take its place, but Dr. Cramp has never been disheartened by the unending nature of the task to which he devoted his life. ("Work" 1937, 565)

The AMA closed the Department of Investigation in 1975. The files that Cramp and his successors had gathered over the decades became known as the American Medical Association Health Fraud and Alternative Medicine Collection, which is the only AMA archive that is open to non-members. ■

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Robert Blaskiewicz (robert.blaskiewicz@stockton.edu) is assistant professor of critical thinking and first-year studies at Stockton University in Galloway, New Jersey. He studies medical quackery, conspiracy theory, and pseudoscience.

Mike Jarsulic (mjarsulic@bsd.uchicago.edu) is the senior HPC administrator at the University of Chicago's Biological Sciences Division. His skeptical interests include cancer quackery, the history of skepticism, and philosophy of science.

Grand Illusions and Existential Angst

Natural illusions have impeded civilization's progress toward enlightenment for millennia. Here's an inventory of a few prominent illusions that have had a tenacious grip on our collective wisdom.

ALAN J. SCOTT

The great promise of a hyper-connected society having the world's knowledge at its fingertips was better decisions and a more enlightened citizenry. The great disappointment is the proliferation of fake news and ways to confirm to ourselves what we already felt to be true—whether that is the case or not.

In many ways, society progresses only when people question what is already known; as Thomas Paine proclaims, "It is error only, and not truth, that shrinks from inquiry" (Paine 1737–1809). The scientific apparatus is, arguably, the best tool for such inquiry. It has been laying waste to social hubris and human arrogance by identifying illusions for centuries.

It was common knowledge that a heavy rock falls to the ground faster than a small, lightweight pebble—until Galileo questioned such knowledge. Acknowledging our propensity for self-deception is an unparalleled route to enlightenment.

Overcoming self-deception is at the heart of science, maintains physicist Robert Muller. "A layman is easily fooled and is particularly susceptible to self-deception. In contrast, a scientist is easily fooled and is particularly susceptible to self-deception, and knows it," he says (Muller 2017). Here are some more grand illusions science has revealed.

We curse the bedpost when it reminds our big toe of its solid rigidity. But the post is mostly empty space, as is our toe. Atoms are 99.99999999999 percent empty space. Soothing our big toe injury by consuming a dessert drink, we notice that a vacuum seems to pull liquid up the straw, which is, in fact, not the case! Outside air pressure pushes the liquid up.

For millennia people believed Earth was the center of the universe. Twenty-five percent of people in the United States still believe the Sun goes around the Earth (Neuman 2014), which calls to mind Isaac Asimov's statement "Scientific apparatus offers a window to knowledge … scientists spend ever more time washing windows" (Asimov 1988). The Earth also seems quite flat, though scholars have known it to be spherical since the days of the ancient Greeks.

The scientific apparatus has been laying waste to social hubris and human arrogance by identifying illusions for centuries.

Our intuition suggests that something needs to be pushing an object for it to remain in motion. The brilliance of Isaac Newton told us otherwise: objects will continue moving for all eternity if left unimpeded by outside influences.

When you look at a yellow lemon on a pixelated electronic monitor, there are no yellow-colored pixels being shown! A

gyroscope seems to magically defy gravity. As for magic, magicians don't practice magic. They practice illusion. As you turn left in your car, you sense a force shoving you right, though, there is no such force.

Hiking in polar regions, or in high alpine, may cause you to stumble upon magnificent patterns in the ground that seem designed by a divine being or a masochistic artist willing to expend countless hours arranging rocks. Rocks, in a large expanse of geography, have been sorted—some in almost perfect circles. On the surface, it intimates intelligent design, but digging deeper reveals that freeze-thaw cycles, water, and gravity work together to create self-organized sorted patterned ground (Kessler and Werner 2003).

The quintessence illusion in nature, if bona fide, is that of free will. The implications are breathtaking.

The physiology of our eyes and brain can taunt us with static images that appear to pulsate in *autokinetic illusions*. One of the best was produced by Gianni Sarcone called "Hypnotic Vibes" (Sarcone 2014). Sarcone reported that scientists have several theories to explain these illusions, but the precise neurophysiology remains unknown (Sarcone 2013).

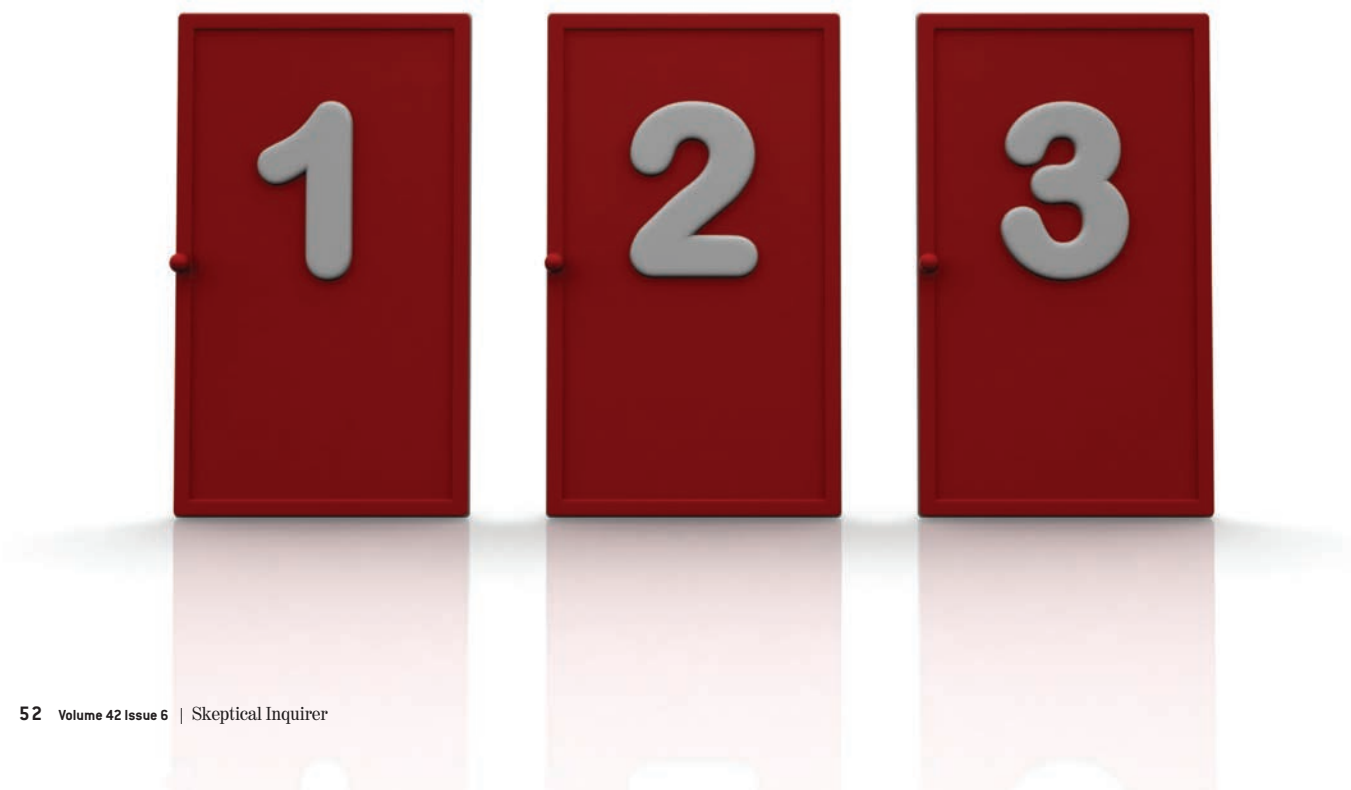
The Monty Hall problem, which is equivalent to Martin Gardner's Three Prisoners problem (Gardner 1959), is a classic illusion in statistics and probability. This problem has you choose from three doors. A new car is behind one. Odds of success are one-third. The host then shows you that the car is not behind one of the other two doors and asks if you would like to stick with your original guess or switch.

Always switching doors brings your odds to two-thirds (and not one-half) as many incorrectly guess. Moreover, letting a coin flip make your decision on whether to switch keeps you with one-third odds![1] This illusion is so strong it created a stir across America back in 1991 when many academics argued incorrectly the odds were one-half (Tierney 1991). (The Skeptical Inquirer played a role in stimulating and probing this controversy, when it reported on a Marilyn vos Savant column about it; see SI Summer 1991 and Winter 1992.)

On a more highfalutin plane, one discovers that time does not march into the future at the same rate for everyone according to Einstein's theory of relativity. It is possible for someone, having been born on Earth a thousand years ago, to still be alive to speak to us today if they have been traveling in space at immense speeds or spending time near a black hole!

It is also known that all objects have a weird wave/particle duality with nonintuitive properties. At the atomic level, an alpha particle inside radioactive uranium should be viewed as being in a superposition of locations that is both inside and outside the nucleus until it is measured as in the classic thought experiment of Schrödinger's Cat in quantum mechanics.

So, how do you imagine a single object in multiple loca-



tions simultaneously (Kaku 2018)? Are you imagining something ghost-like? It is equivalent to imagining a cat that is both dead and alive—simultaneously. Richard Feynman (1965) has commented about this strange reality by saying, "The difficulty really is psychological and exists in the perpetual torment that results from your saying to yourself, 'But how can it be like that?' which is a reflection of uncontrolled but utterly vain desire to see it in terms of something familiar."

It should be noted that describing the object as being in multiple locations simultaneously is only one interpretation. A slightly more mainstream interpretation is that the object does not have definite properties, such as position, until it is observed (Copenhagen Interpretation 2018). Yet giving it an "indefinite position" does little to advance a vivid conceptualization.

Experiments have been conducted of atomic-level particles tunneling through barriers similar to how alpha particles escape uranium (Enders and Nimtz 1992; Recami 2009; Landauer 1993; Nimtz and Aichmann 2015). The results seem to show tunneling speeds faster than the speed of light in a vacuum. Such speeds would violate causality where the effect could precede its cause in certain reference frames, unleashing chaos in scientific and philosophical worldviews.

Alas, such speeds are an illusion—an illusion less accessible in everyday life but profoundly meaningful. The rescue of causality comes from the concept of dispersion and group velocity of a wave packet as it pertains to the particles (Steinber et al. 1993; O'Dowd 2016; Weisstein and Rodriques 2007; Brudny and Mochan 2001).

The quintessence illusion in nature, if bona fide, is that of free will. The implications are breathtaking. It torments philosophers, theologians, and scientists alike. Consider the mass shooting in Las Vegas, Nevada, in 2017 killing fifty-eight people. It was no doubt tragic and prompted Vice President Mike Pence to describe it as an act of "pure evil" (Terez 2017). But this says nothing about the physical science happening inside the shooter's brain, which is the root cause of all behavior.

Implicit in the previous sentence is the conjecture, or axiom, that everything that happens is completely caused by whatever happened before it going all the way back to the big bang, inclusive of probabilistic events from the quantum realm.

The brain is composed of nerve cells, or neurons, of which the operational characteristics are reasonably well understood. Their functionality, within the larger nervous system, is based on electrochemical interactions. There is no evidence to argue otherwise.

This leads to an existential crisis of immense proportions! It shakes the very foundation of volition. We all act as if we are agents of our own destiny who freely make choices somehow outside, or beyond the reach, of the fundamental forces in nature that govern how all objects interact. Sam Harris, a cognitive neuroscientists and ardent doubter of free will, boldly writes, "The illusion of free will is itself an illusion" (Harris 2011).

In the most general sense, this debate splits into two philosophies: those who believe in free will and those who think the brain is mechanistic or deterministic. Definitions of free will vary, but from a physical science perspective, it implies that something outside or beyond the basic interaction of how charges interact is influencing decision-making. Otherwise, it is deterministic.

There are people—some of them well-respected scientists (Dennett 2014)—who insist the collective spatial-temporal neuron activity has *irreducible complexity* and represents emergent phenomena that allow free will to exist. But this argument is a *non sequitur*; emergent complexity in nature does not imply non-mechanistic interactions. And to argue free will and determinism are compatible is a semantics-induced subterfuge of logic. Attempts to salvage free will out of brain functions with quantum influences are inadequate and largely implausible (Lopez-Corredoria 2002; Clarke 2014).

In 1966, Charles Whitman went on a murderous rampage, shooting his mother and his wife, then taking a rifle to the clock tower at the University of Texas at Austin, shooting and killing fourteen more people before being shot and killed by police. Whitman typed up a suicide note in which he puzzled at his actions. He complained of being a victim of unusual and irrational thoughts. In this note, he had the wherewithal to request an autopsy on his brain in hopes of finding something to explain his behavior. An autopsy was done and found a pecan-sized brain tumor that experts concluded could conceivably have contributed to his inability to control his emotions and actions (Charles Whitman 2017).

We all act as if we are agents of our own destiny who freely make choices somehow outside, or beyond the reach, of the fundamental forces in nature that govern how all objects interact.

Theologians have long struggled with the possibility that human free will is an illusion. Astonishingly, the physical science of the brain gets no attention in most religious explorations of free will. They center on resolving the incompatibility of an omniscient deity knowing the future and human free will.

Wikipedia's pages on "free will in theology" (Free Will in Theology 2017) and "predestination" (Predestination 2017) have no references to the physical science of the neuron or brain. This reveals a fundamental chasm between science and theology. Besides, determinism has too high of a philosophical price tag, for it undermines the concept of sin.

On Twitter, God (@TheTweetOfGod) has declared that "Free will was probably a mistake" (Javerbaum 2018). Apparently, comedy writer David Javerbaum serves as the social media communications official for the divine on Twitter. As a follow-up corollary, God has also tweeted "Everything hap-

pens for no reason. It is extremely important to understand this."

Returning to social implications of no free will, this profoundly affects our criminal justice philosophy. Human agency, free choice, and culpability are at the heart of criminal law except in cases of mental disease or mental defect. Determinism says that actions are caused by our past world experiences and genetics. It is absurd to punish a positive charge for being attracted to a negative charge. A new field of study called neurolaw has arisen from legal ruminations on this matter (Mensching 2016; Erickson 2010).

This also nullifies the debate on whether artificial intelligence could ever develop consciousness and free will. These concepts become shapeless and unclear if the human brain is an automaton—a slave to the electrical signals of neuronal firings. Free will becomes a mirage. This does not preclude artificial intelligence from advancing to a higher degree of complexity than the brain. Logically, highly intelligent advanced beings on other worlds would be equally confined in this existential angst.

The concepts of consciousness and free will become shapeless and unclear if the human brain is an automaton—a slave to the electrical signals of neuronal firings. Free will becomes a mirage.

Katherine Hepburn told Humphrey Bogart in the movie *The African Queen* that "Nature, Mr. Allnut, is what we were put in the world to rise above" (*The African Queen* 2017). The illusion of free will casts doubt on our ability to do so. It is a dark nihilistic existential cloud that hovers over our existence. The late Stephen Hawking made connections with brains, computers, and the afterlife by retorting "I regard the brain as a computer which will stop working when its components fail. There is no heaven or afterlife for broken-down computers; that is a fairy story for people afraid of the dark." (Joseph 2018).

Evolutionary biologist Jerry Coyne (2017) concurs with the view that free will is an illusion as it relates to consciousness and the human mind. He argues that such worldviews greatly disturb the philosophical foundations of crime, wars, and politics. Christopher Hitchens, in his unique, witty way, enunciated: "Of course we have free will, because we have no choice but to have it" (Hitchens 2010).

Nevertheless, a world devoid of free will does not imply our existence is meaningless and improvement is futile. It is still important to corral our primitive instincts with social laws and expectations that modify human behaviors to improve the quality of our existence.

Our journey is elevated by recognizing nature the way it is—and not the way we would like it to be. It is elevated by acknowledging that you had no free will in reading these words, yet you still persist in seeking answers to important questions.

Caltech physicist Sean Carroll ponders the lofty philosophy of free will in his book *The Big Picture*. In it he argues:

> We are part of a universe that runs according to impersonal underlying laws, we nevertheless matter … . We are small; the universe is big. It doesn't come with an instruction manual. We have nevertheless figured out an amazing amount about how things actually work. It's a different kind of challenge to accept the world for what it is, to face reality with a smile, and to make our lives into something valuable. (Carroll 2016)

Adding value, dignity, and esteem to life is what possesses geniuses of all ages. Exposing illusions is one important way in which science adds value. In this sense, such actions follow the spirit of Socrates in pursuing an examined life (The Unexamined Life Is Not Worth Living 2017). The French playwright and philosopher Jean-Paul Sartre wrote, "Man is nothing else but that which he makes of himself" (Sartre 1946). Our lot is to acknowledge and affirm an optimistic existentialism of being able to see the universe for what it is. ■

Note

1. The author of this article built a Python language computer code utilizing a Python random number generator module to confirm the probabilities regarding the Monty Hall problem.

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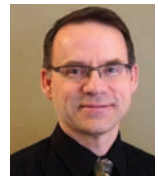


Alan J. Scott is a professor of physics at the University of Wisconsin-Stout, Wisconsin's Polytechnic University, in Menomonie, Wisconsin. He received his PhD in 1995 from Kent State University in experimental nuclear physics and is currently active in science education issues and astrophysical research. He wrote "No Time for Certainty" in our January/February 2017 issue.

There's much more available on our website!

Skeptical Inquirer

Here's just a sample of what you'll find online at csicop.org:

Challenging Claims of Electronic Voice Phenomena (EVP)

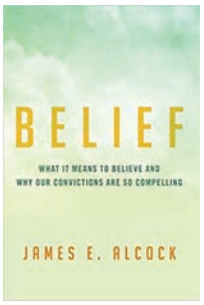
Intrepid investigator Kenny Biddle devised a way to test one common ghost claim about EVP or ghost voices. At New Jersey's White Hill Mansion he took an object "and carried it into every room on every floor of the mansion. I spoke out loud (and had video recording me the entire time), proclaiming who I was, what I was doing, what the name of the target object was, and exactly where it was going to be hidden. I have no doubt that if ghosts are haunting the mansion they heard me." He then hid the object somewhere in the building and issued a $500 challenge: "If a team (or individual) can submit an unedited, continuous video of them conducting an EVP session, obtaining EVPs that clearly tell them what the target object is and where it is hidden, they win the prize. This really shouldn't be too difficult, because it's basically what ghost hunters are already doing—asking specific questions and claiming to receive direct responses."

The 'Secret Hand Signs' Conspiracy

SI Deputy Editor Benjamin Radford examines the recent controversy surrounding the Senate confirmation hearings for Supreme Court nominee Brett Kavanaugh, when rumors circulated that a lawyer sitting behind Kavanaugh was caught on camera flashing a white nationalism sign with the fingers of one hand as her arms crossed. Radford examines other alleged secret hand signs (such as a "Satanic" symbol flashed by Hillary Clinton and Barack Obama and an apparent endorsement of the Illuminati by Beyonce) as well as the role conspiracy thinking plays in how people interpret ambiguous signs.

How We Believe

Harriet Hall



Belief: What It Means to Believe and Why Our Convictions Are So Compelling. By James E. Alcock. Amherst, NY: Prometheus Books. 2018. ISBN: 9781633884038. 638 pp. Hardcover, $28.

In James E. Alcock's classic 1995 Skeptical Inquirer article "The Belief Engine," he wrote, "Our brains and nervous systems constitute a belief-generating machine, a system that evolved to assure not truth, logic, and reason, but survival."

Now he has expanded that thesis into a book, *Belief: What It Means to Believe and Why Our Convictions Are So Compelling*. It's much more than a book about belief. In the foreword, Ray Hyman says it would be an ideal textbook for a course that provides an integrated overview of all the areas of psychology. He says every psychologist and psychology student should read it. It is an outstanding achievement of scholarship; its 638 pages include over seventy pages of references. It covers everything from the latest findings in neuroscience to a catalog of many of the questionable beliefs people hold and why they hold them.

Alcock is the ideal person to write such a book. He has a BSc in physics and a PhD in psychology and has been teaching psychology at York University since 1973. He is one of the founders of the Committee for Skeptical Inquiry (formerly CSICOP), a CSI fellow, and a member of its Executive Council. He has also won numerous awards for skepticism and psychology. He has written extensively on social psychology and the psychology of belief. He is a registered clinical psychologist with his own private practice and is also an amateur magician. He has stature in both senses of the word (if I remember correctly, he's about six-foot-five).

The Power of Belief

Beliefs guide all our thoughts and behaviors, from brushing our teeth to voting for a particular political party. They have power over life and death: people have willingly died for their beliefs, and someone commits suicide terrorism every forty seconds. Alcock elucidates the various factors that contribute to suicide terrorism. And he tries to explain why some beliefs are so powerful that they are impervious to reason and evidence.

Beliefs guide all our thoughts and behaviors, from brushing our teeth to voting for a particular political party. They have power over life and death.

There is nothing fundamentally different about the nature of beliefs that we consider rational and those we deem irrational. We do not choose our beliefs; they are generated and maintained through automatic processes in our brains. Alcock explains what goes into those automatic processes: perceiving, remembering, learning, feeling, and thinking. And he shows how those processes can depart from reality.

The brain uses sensory input to construct schemas that may not represent the real world accurately. It fills in missing information. It creates visual illusions. Attention is selective: We think we are aware of everything in our environment, but we aren't. We see things (pareidolia) and hear things (apparent words in random noise) that are not really there. We sometimes confuse mental imagery with external reality. So, we need to be cautious when basing a belief entirely on what our senses tell us.

Recent research has revealed how unreliable our memory is, even when we are most confident that we are remembering correctly. Memories are reconstructed each time we remember. Experiments have shown how easily false memories can be implanted and elaborated. Contaminating influences can distort our memories in various ways. Memories "recovered" under hypnosis are confabulations. Eyewitness testimony is notoriously unreliable; errors and bias in memory have led to false convictions and ruined lives. It's clear that memories should not be treated as unshakable foundations for our beliefs.

Alcock explains how we learn through our own experience, through watching others, through what we are taught, and through what we read. Many beliefs are established in childhood: children soak up new information like a sponge. He covers classical conditioning, operant conditioning, reinforcement, superstitious conditioning, and the power of coincidence. He shows that we must trust others for most of our information and discusses how we decide whom to trust. He

shows how beliefs influence emotions and emotions influence beliefs. Belief in magical remedies can reduce despair when scientific medicine can't provide a cure. Learning from others means we must trust their accuracy, reliability, and honesty, which leaves us open to error and manipulation. We must use critical thinking skills to help us separate fact from fiction.

Thinking Processes

Alcock explains the two types of thinking: System 1 (experiential, intuitive) and System 2 (rational). System 1 thinking involves intuitions and rules of thumb that are a practical necessity for rapid response and the necessities of daily life. However, our intuitions are subject to many biases, including the availability heuristic, the simulation heuristic, the representativeness heuristic, the introspection illusion, and confirmation bias. He discusses hunches gone wild, the Gambler's Fallacy, misunderstanding probability and statistics, the need to look at base rates to determine what is anomalous and what isn't, and so on. System 2—rational processing—can be led astray by errors of logic, belief bias, abduction reasoning, and enthymematic reasoning (reasoning from an unstated premise). Logic doesn't come naturally; it can be trumped by emotion and intuition and be sullied by various errors and biases. It's important to remember that even rational thinking can be fallible.

Alcock also focuses on how beliefs are formed, how some beliefs resist change while others submit to contradictory information, and how beliefs motivate people to achieve difficult goals, even to the extent of dying for them. We all hold beliefs that are wrong but that seem just as reasonable as any other belief. We automatically believe new information; only later do we examine it for truth. True knowledge must be based on evidence, but we can't personally verify many of our most important beliefs, so we must rely on the pronouncements of authorities.

Before people's actions and allegiances change, their beliefs must change. Many beliefs are so entrenched that they resist powerful evidence against them. Alcock addresses collective delusions, conspiracy theories, and moral panics such as the one that led to false accusations of Satanic ritual abuse. He lists the factors that make beliefs unlikely to change, the ways people rationalize away new evidence, and how disconfirmation can actually strengthen beliefs. And he discusses how sometimes even the most extreme beliefs can change through conversion. He covers persuasion, Hitler's cardinal rules for successful propaganda, gas-lighting, brainwashing, interrogation, fake news, alternative facts, and post-truth. He describes some of the suggestions in the psychological literature for getting people to change their beliefs.

The brain uses sensory input to construct schemas that may not represent the real world accurately. So, we need to be cautious when basing a belief entirely on what our senses tell us.

The book discusses suggestibility, the Barnum Effect, cold readings, imposters, con artists, hoaxes, Ponzi schemes, Nigerian email scams, lie detection, and self-deception. He stresses that we can all be fooled. We are poor at detecting deceit in others and fail to recognize when we have fooled ourselves. Alcock explains how our beliefs about our bodies, our minds, and our well-being sometimes stray significantly from reality. He covers various illusions such as phantom limbs, the rubber hand illusion, body maps, the "ghost in the machine" belief, the mystery of consciousness, the workings of the unconscious, and ideomotor actions (dowsing, Ouija boards, etc.). Recent research has established that our actions are determined unconsciously before we are consciously aware that we have decided to act.

The brain can fool us with remarkable experiences that we can't distinguish from external reality, often accompanied by strong emotions and lasting effects. Alcock covers transcendental experiences, hallucinations, out-of-body experiences, meditation, hypnosis, dreams, and sleep paralysis. There can be illness (subjective symptoms) without disease (pathophysiology). Beliefs about the state of our health may not reflect the actual state of health but can contribute to it. Is stress harmful? The *belief* that stress is bad for us can be deleterious to our health. Alcock examines possibly unreliable reports of people scared to death, dying after hexes or curses, the "broken heart" syndrome, etc. He discusses hysteria, mass hysteria, hypochondria, the worried well, and questionable mental diagnoses, including multiple chemical sensitivity and electromagnetic hypersensitivity.

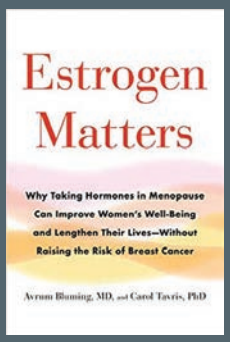
Belief and Healing

Feeling better after a treatment doesn't necessarily mean we actually *are* better. Suggestion is powerful, and healing rituals are persuasive. He covers Anton Mesmer's "animal magnetism," placebo effects, sham surgeries, learned responses, expectancy effects, conditioning, social learning, and theological placebos. He says there are three types of healing: natural (the body heals itself), technological (drugs, surgery), and interpersonal that depends on context and personal interactions and that leads to improvements in *illness* but not in *disease.*

Belief includes a long chapter on belief in remedies that either lack evidence of effectiveness or have been proven ineffective. He covers traditional Chinese medicine, *qi gong*, acupuncture, homeopathy, naturopathy, chiropractic, aromatherapy, therapeutic touch, Reiki, thought-field therapy, and cranial-sacral stimulation. He investigates the reasons people choose alternative medicine and reject science-based treatments and vaccines. He covers beliefs in psychology,

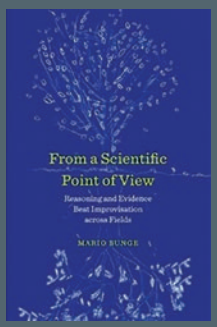
[NEW AND NOTABLE

Listing does not preclude future review.


Estrogen Matters
Why Taking Hormones in Menopause Can Improve Women's Well-Being and Lengthen Their Lives—Without Raising the Risk of Breast Cancer
Avrum Bluming, MD, and Carol Tavris, PhD

ESTROGEN MATTERS: Why Taking Hormones in Menopause Can Improve Women's Well-Being and Lengthen Their Lives—without Raising the Risk of Breast Cancer. Avrum Bluming, MD, and Carol Tavris, PhD. The book's subtitle tells the story. Bluming, a medical oncologist, and Tavris, a social psychologist, return to the story of hormone replacement therapy (HRT), which helped women ease symptoms of menopause throughout the 1970s, 1980s, and 1990s. The therapy was largely abandoned after 2002 once the "Women's Health Initiative" asserted, in what the authors call "a fear campaign," that there'd been an uptick in breast cancer among women taking HRT. The authors track the convoluted history of this issue and present a compelling case for resurrecting HRT. They draw on laboratory research, studies of pregnant women, and survival data to show that it is time to reconsider the fears about HRT, showing its benefits far exceed the risks. Little, Brown, 2018, 320 pp., $27.00.

FROM A SCIENTIFIC POINT OF VIEW: Reasoning and Evidence Beat Improvisation across Fields.



Mario Bunge. A valuable short book on the scientific worldview by the noted physicist-philosopher of science (and CSI fellow) Mario Bunge, author of seventy-four previous books. Bunge argues that the scientific worldview can be adapted to all fields, from agriculture to medicine, the law, and policy-making. It is the best worldview, he argues, "because it is the most demanding and the most open to all. Indeed, it shuns improvisation and free-wheeling, demands argument and corroboration, encourages poaching on whatever discipline promises to be helpful, and solicits criticism, preferably of the constructive kind." Other key features are curiosity, disciplined imagination, cogent argument, the search for pattern and evidence, and moderate or partial skepticism. He applies the scientific worldview to a number of topical cases, from gravitational waves to mental disorders and social and economic policies. Cambridge Scholars, 2018, 161 pp., $119.95.

THE SKEPTICS' GUIDE TO THE UNIVERSE: How to Know What's Really Real in a World Increasingly Full of Fake. Steven Novella, MD, with Bob Novella, Cara Santa Maria, Jay Novella, and Evan Bernstein. Steven Novella (Yale University School of

including recovered memories, EMDR, Munchausen by proxy, and seasonal affective disorder. He concludes, "Let careful scientific research rather than hyperbole, gushing testimonials, or 'ancient wisdom' be the foundation for our beliefs about what is or is not effective."

That would be a good motto for the Science-Based Medicine website.

Before people's actions and allegiances change, their beliefs must change. Many beliefs are so entrenched that they resist powerful evidence against them.

We are born magical thinkers, and magical thinking is hard to overcome. Alcock delves into beliefs associated with magic, religion, superstition, and the paranormal, examining how they reflect our constructed representations of reality. He discusses stage magic, sympathetic magic, magical thinking, hyperactive agency detection, magical contagion, and the persistence of superstitions. In separate chapters, he covers the origins and psychological benefits and harms of religion, anomalous experiences and parapsychology, illusory experiences, and a caboodle of strange beliefs, from alien abductions to the Bermuda triangle, from electronic voice phenomena to reincarnation, from fire-walking to energy fields, from spontaneous human combustion to astrology.

Building a Firewall against Folly

In the final chapter, Alcock shows how we can all become better at critical thinking. He gives these eight rules:

1. Remember that we can all be fooled.
2. Be wary of your intuitions.
3. Be wary of the Fundamental Attribution Error: attributing people's behavior to their characters and intentions while overlooking the power of the situation.
4. Be wary of validation by personal experience.
5. Don't rely on a single source of information.
6. Don't over-interpret correlations.
7. Ask "compared to *what*?"—a wine was rejected because it was found to contain two million asbestos particles per liter, but the concentration of asbestos par-

ticles in the city water supply was higher than that.

8. In the face of inadequate evidence, suspend judgment rather than jumping to conclusions

Finally, he reminds us that critical thinking means we should be prepared to disagree with ourselves, which is never easy.

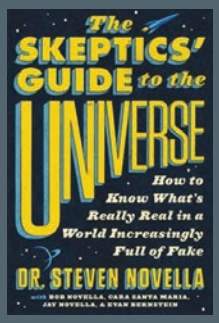
A Great Book

Belief: What It Means to Believe and Why Our Convictions Are So Compelling covers a huge variety of topics. It's written in a style that is accessible and appealing to the lay audience yet rigorous enough to satisfy professionals. I think everyone would benefit from reading it. It is the equivalent of a psychology course and an owner's manual for the brain; it explains how our minds work, how we come to believe the things we do, and why it is hard to change those beliefs. It explains our biases and errors and how critical thinking can help us distinguish true beliefs from false ones. It combines the latest scientific knowledge with the best incisive thinking. It provides insight into many of the problems facing our society. And it's an entertaining encyclopedia of strange and false beliefs.

The book's principles are illustrated by many fascinating examples and anecdotes. My favorite was the rectal piano. One of Alcock's patients held the delusion that there was a small piano in his rectum, and he was obsessed with a desire to play it. He wanted to have his fingers surgically removed to eliminate the temptation! Alcock asked if he had considered having the piano removed; he thought that was a great idea and asked Alcock if he would do the surgery.

I can't praise this book enough. You can borrow it from your public library for free or buy the Kindle edition for only $11.99. Read it! It will educate you and entertain you, and you will begin to question some of your beliefs that you might not have thought to question before. Our society would be a much better place if everyone would read this book and absorb its lessons. ■

Harriet Hall, MD, "the SkepDoc," is an SI contributing editor and columnist.



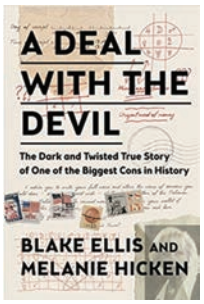
Medicine) and his colleagues from the popular podcast *The Skeptics' Guide to the Universe* here draw on their experience and research to address how to combat the misinformation, bias, myths, deception, and flawed knowledge filling our world. It is a comprehensive guide to critical thinking skills, the difference between science and pseudoscience, how to discuss conspiracy theories with your gullible friends, and how to apply all that to everyday life. The book includes iconic examples of pseudoscience and deception and a valuable section on skepticism and the media addressing fake news, false balance, science journalism, and other issues. Grand Central Publishing, 2018, 478 pp., $30.00.

THE WORLD OF LORE: Monstrous Creatures and **THE WORLD OF LORE: Wicked Mortals**. Aaron Mahnke. Mahnke, host of the popular *Lore* podcast, has written a series of books titled *The World of Lore.* Two recent entries are *Monstrous Creatures* and *Wicked Mortals,* with more on the way. *Monstrous Creatures* examines a variety of monsters, including Spring Heeled Jack, the Jersey Devil, the kraken, werewolves, leprechauns—and, oddly, curses. *Wicked Mortals* covers such historical figures as Elizabeth of Bathory, H.H. Holmes, Burke and Hare, the Pied Piper of Hamelin—and, oddly, an alleged victim of spontaneous human combustion. The entries throughout the series are a wildly mixed bag and appear in ambiguously titled chapters such as "A Little Peculiar" and "Back to Nature" with no clear organization or unifying theme. The narratives are clearly geared toward the general reader and are less interested in skepticism or scholarship than in telling a spooky story (Mahnke ends most sections with a short, melodramatic sentence, such as "She never heard from them again!" or "Something, perhaps, that's *supernatural*"). The books' conversational tone limits their usefulness to researchers looking for critical analysis, and the entries are mostly short, typically spanning a page or two. The books have no index and instead offer short bibliographies (the prevalence of online resources suggests the depth of Mahnke's research, though a few published books are cited). Overall, *The World of Lore* series is an amusing—if superficial and often mystery-mongering—perusal of both real and fictional curiosities. Penguin Random House, 2017/2018, 300/320 pp., $23.81.

—Kendrick Frazier and Benjamin Radford

When Psychics Come Under Control of Organized Crime

Wendy M. Grossman



A Deal with the Devil: The Dark and Twisted True Story of One of the Biggest Cons in History. By Blake Ellis and Melanie Hicken. New York: Atria Books. 2018. ISBN: 978-1-5011-6384-5. 304 pp. Hardcover, $26.

In the 1990s, it was common to see ads in British magazines—chiefly aimed at women, if I remember correctly—for "psychic" services. A number of these advertised amulets or talismans that would be sent to you if you wrote to the address provided, and these were supposed to do wonderful things for your life. One of our skeptics filed a complaint with the Advertising Standards Authority and got a ruling to require these ads to make less absurd promises.

One name in particular popped up a lot in those ads: Maria Duval. I briefly tried corresponding with her operation to see what would happen. Not much, as I recall: you got a cheap talisman trinket of some sort and were encouraged to write back, enclosing some very small amount of money, and it didn't seem worth pursuing (plus, I draw the line at sending money). It seemed "mostly harmless," as Douglas Adams might have said, aside from the stupidity of the whole thing. It's embarrassing to see how wrong I was.

In A *Deal with the Devil*, Ellis and Hicken tell the story of how they investigated a complex, decades-long fraud.

Twenty-five years later, in 2017, CNN investigative reporters Blake Ellis and Melanie Hicken were casting around for their next project. They had covered an abusive debt collector in Texas who was operating all over the country on behalf of government agencies, and they had exposed out-of-control animal control agencies in small towns. Now that they had some time, they turned to the boxes of mail sent them by readers concerned about charities and scams preying on the elderly. Among the fake charities and scaremongering political groups they found a psychic: Patrick Guerin. A search result showed he had been named in a Department of Justice action in 2016, which had permanently barred eight individuals and entities from operating "an alleged international multi-million dollar mail-fraud scheme in the name of alleged psychics." Guerin, they learned, was the small fry. The big name was Maria Duval.

In *A Deal with the Devil*, Ellis and Hicken tell the story of how they investigated this complex, decades-long fraud. Like many of the investigative tales that surface every year at the summer school run by London's Centre for Investigative Journalism (CIJ), most of it revolved around sourcing and reading thousands of documents and connecting the faintly discernible dots found in them. As CIJ speakers will tell those hoping to do this kind of work, you're in a much better position to speak to someone when you already have the proof of what happened: "This is what happened, isn't it?" is a powerful tongue-loosener.

What they found was that Maria Duval was a real person, a Frenchwoman who became famous for psychic claims—the same as the ones used in the letters, or close to them. But at some point, probably around the mid-1990s, she sold the rights to her name to a group of scammers who used it in ads such as the ones I saw. Under the contract she had signed, she was required to go on making personal appearances wherever they sent her and stand by as they used her name on millions of letters. People who responded with more diligence than I did were sucked into sending more and more money in response to what appeared to

You're in a much better position to speak to someone when you already have the proof of what happened: "This is what happened, isn't it?" is a powerful tongue-loosener.

be personal attention and concern. In the cases where Ellis and Hicken spoke to victims personally, it was clear that the scam preyed on lonely, vulnerable, often cognitively impaired older people, whose relatives often didn't realize what was happening until thousands of dollars had been stolen. Overall, the scam collected hundreds of millions of dollars from more than a million people in the United States alone. It appears to be ongoing in other countries, and a Postal Service criminal investigation was under way as of July 2018.

This is a twist we skeptics never saw coming: that those who have become famous for their psychic claims could effectively sell their businesses to organized crime and become pawns of their new bosses. In terms of exploiting the victims, it is a logical extension of the "sucker lists" known to be kept by other kinds of fraudsters. In terms of the psychics themselves, it suggests a startling lack of ability to foresee what they could be getting into.

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By the time Ellis and Hicken finally met Duval, she, too, was elderly, frightened, reclusive, and cognitively impaired. By the time the Postal Service arrived at Duval's door in France, Duval could not remember her own name and, her son told them, had been declared incompetent. Without the personal appearances to fuel her popularity, the impact of the letters is fading. But, as Ellis and Hicken conclude, the real scammers at the heart of it all are still active.

The story is an important lesson for skeptics, too, when we think about consumer protection. Yes, we need to help people protect themselves against psychic scams. But we may need to turn our attention to working more collaboratively with psychic claimants who are themselves at risk—and who can be captured to become the vectors for enormous widespread damage. ■

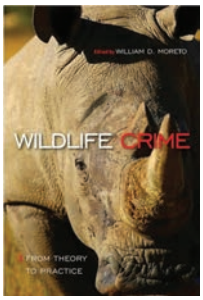
Wendy Grossman founded and was twice editor of *The Skeptic*, the U.K. skeptic magazine.

A Detailed Primer in Fighting Wildlife Crime

Bob Ladendorf

The body parts of some wildlife, such as rhino horn, are more valuable than gold or heroin. The worldwide illegal trade is, in fact, one of the top four types of transnational crime (the other three include narcotics, human trafficking, and military weapons). This illegal trade attracts criminal networks that often smuggle wildlife parts along with legitimate goods. The demand for wildlife and their body parts, many of which are from endangered species, is so great because of population growth, global wealth, and superstitious beliefs. The markets will continue to expand despite efforts by governments, NGOs, environmental organizations, and individuals to stop the demand and the culture of consumption and corruption.

These are just a few of the highlights gleaned from the new book *Wildlife Crime: From Theory to Practice*, edited by William Moreto, assistant professor of criminal justice at the University of Central Florida. Moreto has gathered a number of academics to lay a foundation, explore methodologies, and describe real-world efforts to thwart wildlife crime. While this is an academic book, its comprehensive coverage of the range of crimes and how those are



Wildlife Crime: From Theory to Practice. Edited by William Moreto. Philadelphia, PA: Temple University Press. 2018. ISBN: 978-1-4399-1472-4. 306 pp. Hardcover, $104.50; softcover, $37.95; Kindle, $37.95.

The body parts of some wildlife, such as rhino horn, are more valuable than gold or heroin.

fought nationally and internationally makes the book a good primer.

Of particular interest are the scattered descriptions of the demand for wildlife parts worldwide, but particularly in the East Asian countries, for their alleged traditional Chinese medicinal properties, as souvenirs or good-luck trinkets, and as money-makers and status symbols. Turtle eggs are believed to have aphrodisiac qualities; elephant ivory has been used as religious icons, among many other uses; and, as Louise Shelley and Kasey Kinnard state in their chapter, those buying rhino horn and ivory in Asia "are doing so as an investment, banking on the extinction or increased rarity of animals ... or as a means of displaying wealth for the growing middle class, particularly in Vietnam ... ."

Moreto has gathered a number of academics to lay a foundation, explore methodologies, and describe real-world efforts to thwart wildlife crime.

Many chapters make for compelling reading and understanding of the range of pressures on wildlife in recent times.

That demand, according to one chapter writer, keeps prices high in the black market because of the scientifically unproven beliefs that the illegal animal products cure diseases such as cancer and ensures "the emergence of criminal networks involved in large-scale poaching and smuggling operations all over the world." While another writer disputes the assertion about criminal networks in his chapter, the overwhelming evidence from other researchers demonstrates the impact of criminal enterprises. This evidence includes the recent Elephant Action League investigative report about the involvement of a Mexican cartel and the Chinese mafia in the smuggling of totoaba fish swim bladders. This has caused the near-extinction of vaquitas, a marine mammal that is caught in gill nets. Law enforcement arrests worldwide demonstrate the impact of these criminal enterprises.

While the book includes useful theoretical frameworks for studying the often-elusive process of wildlife parts trafficking, such as Smith's 1980 "spectrum-based theory of enterprise"—that organized crime is a transnational business instead of *Godfather*-like ethnic groups—other chapters feature mind-numbing theoretical constructs and needless organizational charts. At times, reading the book gave me a MEGO (My Eyes Glaze Over) reaction, a term I learned years ago while attending a Senate hearing in Washington, D.C. In addition, a glossary of terms and organizations would have enhanced the book.

Nevertheless, there are excellent nuggets of information scattered throughout the book.

For instance, in that same MEGO chapter promoting a transdisciplinary approach to wildlife crime prevention, the writers mention that another source argues that "iconic species such as tigers, Asian bear, Asian rhino, and pangolin are under more pressure from illegal hunting than they are from habitat loss, and … we risk losing these wild animals in a few years if this criminal activity continues."

Other chapters dealing with the impact of corruption and globalization, surprising ecotourism demands, wildlife rangers who risk their lives, and "pseudohunts" make for compelling reading and understanding of the range of pressures on wildlife in recent times.

Perhaps no better description of the cruelty and pseudoscientific beliefs driving humans is the condor-bull fights. For the Andean Yawar Fiesta, a condor is tied to the top of a bull, who is deliberately disoriented with explosives while the condor claws and chews the bull to death. The absurd "traditional" ceremony now has been adapted so that a "performance" for tourists brings more money to the communities. As for the "woo" factor, one seller says that condor feathers are used "for cleaning the coronary chakra, cleaning bad energies."

In an opening chapter, Avi Brisman and Nigel South discuss criminology approaches, emphasizing that the traditional criminology is anthropocentric and needs to be refined so that more emphasis is made on wildlife crimes. They quote a wildlife protection organization director who says that we face a global extinction of wildlife for the first time since the demise of the dinosaurs sixty-five million years ago. That sobering thought will stick with the reader throughout the book. In their concluding remarks, the writers quote another source:

> One thing that remains clear is that "as the planet's remaining wilderness is degraded, each generation grows up with an increasingly impoverished view of natural biodiversity, so that human experience itself is undergoing a form of extinction ... ." If this continues, then future generations may inherit an Earth bereft of biodiversity—one without animals in the wild or in the realm of human fantasy.

Moreto has put together a wealth of approaches to new ways of thinking about criminology and wildlife crime. As the old saying goes, "An ounce of prevention is worth a pound of cure." That ounce of prevention includes overturning human superstitions, greed, and status so that never-ending pound of cure can be made unnecessary. ■

Bob Ladendorf is a freelance writer, former chief operating officer at the Center for Inquiry L.A., and coauthor (with his son Brett) of "Wildlife Apocalypse: How Myths and Superstitions Drive Animal Extinctions," which appeared in the July/August 2018 issue of Skeptical Inquirer. He has also reviewed a documentary about the disgraced Andrew Wakefield and Michael E. Mann's book on climate change for this magazine.

Wildlife Apocalypse?

As a natural resource economist, I appreciated the supply and demand framework in "Wildlife Apocalypse" (July/August 2018). The trade driving animal extinctions is complex, with legal, social, and economic dimensions, and the myth foundation underlying the problem provided readers with insights to what is driving the demand that threatens some endangered species. That purely legal solutions hardly work was made obvious.

The economist in me wanted a discussion of how economics—that created the problem—is also the best tool to protect these animals. While regulatory schemes have not proven effective in providing protection, economic ones based on giving local communities some sort of defined property rights in the wildlife populations, plus benefit-sharing so that those communities have a stake in preserving the wildlife, have proven to actually make a difference. Economic and free market solutions generally have the least unintended consequences; basic market-based approaches such as taxes and tradable quota systems have produced revenues that allow governments to develop protection programs or, better yet, give local communities revenue and an incentive to value protection.

The entire article was really one on applied resource economics. I understand the economic solutions can seem complex, but there are plenty of simple examples where the free market approach has turned around a declining wildlife population. A discussion of those would have made a very interesting article even more interesting.

Thomas J. Straka
Department of Forestry and Environmental Conservation
Clemson University
Clemson, South Carolina

The Creationists' Flood

In his generally effective rebuttal of creationist flood geology (Follow Up, "Response to Ken Ham … ," July/August 2018), Lorence Collins states that the "birds" present in the Niobrara seaway chalks are actually nondinosaurian pterosaurs. Although pteranodonts and nyctosaurs did make up the great majority of flying archosaur fossils from those Cretaceous sediments, there are full blown birds present in the form of the gull-sized and -like ichthyornids, as well as the big flightless hesperornithid divers. Both were toothed avian dinosaurs that went extinct by the end of the Mesozoic. As for what killed the individual birds whose fossil remains have been found, it was probably normal attrition due to age, disease, injury, and the like; there is no need to invoke special mass mortality events.

Gregory Paul
Baltimore, Maryland
(Gregory Paul is author of the upcoming *Princeton Field Guide to Pterosaurs*.)

Lorence Collins replies:

Undoubtedly, Gregory Paul is correct about the presence of avian dinosaurs (with teeth) being present in the Cretaceous sediments in Kansas, but Andrew Snelling called them birds rather than avian dinosaurs, so my comment still is viable and has merit. Gregory Paul should be thanked for his knowledge and information.

In his excellent response to creationists regarding Noah's Flood (July/August 2018), Lorence Collins makes a chemical error. Bones are not composed of calcium carbonate but rather calcium phosphate. He is still correct in asserting that this will not readily dissolve in a sea already saturated with calcium ions.

This brings me to a favorite objection of mine (being a chemist). To deposit 200 meters of chalk (density 2500 kg/m^3) from a water column the same depth would require that the sea originally held a staggering 2.5 kilograms of calcium carbonate per liter of solution. Yet calcium carbonate is insoluble. If creationists can come up with a way of keeping that level of calcium carbonate dissolved, and precipitating it on demand, then I suggest they patent it immediately. The market for preventing lime-scale is huge.

Stephen Moreton, PhD
Great Sankey

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Warrington
Cheshire, England, UK

Those Illusory Canals

SI readers who enjoyed Matthew Sharps's insightful article on Percival Lowell and Mars (May/June 2018) might be interested in reading my concurrent piece "Canal Mania" in the July 2018 issue of the popular astronomy magazine *Sky & Telescope*. The ready acceptance of Lowell's putative canals by numerous contemporaries must also be seen in the context of other social and economic factors at the time.

As I point out in "Canal Mania," shipping and irrigation canals proliferated in huge numbers in Britain, Canada, and the United States during the industrial revolution of the 1800s. Some 6,000 kilometers of canals were built in Britain alone during the Victorian era, along with major efforts such as the Lachine, Welland, and Erie canals, and the world-changing Suez and Panama projects. In addition, numerous irrigation ventures were underway in Lowell's backyard, Arizona, and other southwest states, so as to tame the desert "wastelands" and promote agriculture. As a consequence, canals were seen as modern technological wonders to advance human (and why not martian?) civilization.

A second factor to recall during the eighteenth and nineteenth centuries was the doctrine of the "plurality of the worlds," which held that most celestial bodies must be inhabited since God would not create anything without purpose. That "purpose" of course is to create rational beings on those worlds just like on ours. Though going back as far as ancient Greece, this doctrine was formalized by philosopher David Lewis, who wrote in his 1886 book *On the Plurality of Worlds*, "and that we who inhabit this world are only a few out of all the inhabitants of all the worlds." Many prominent scientists and thinkers were adherents of this thesis, including Christian Huygens, John Locke, William Herschel, John Adams, and Isaac Newton among others.

In light of this widespread belief, it's not surprising that many late-nineteenth–century people were open to claims that the other most Earth-like planet is inhabited by industrious, sentient beings who, like us, built canal networks to syphon water from the martian poles to its arid equatorial regions. Finally, it must be pointed out that not all martian "canals" were illusory, just not artificial. Most prominent among these is the giant canyon, Valles Marineris (called Coprates by Lowell), a prominent fracture zone Cerberus Fossae, and a number of windswept dust streaks crisscrossing the Red Planet.

Klaus R. Brasch
Flagstaff, Arizona

Fake Medicine and Fake News

The July/August Skeptical Inquirer contained many thought-provoking articles. In "FDA Has Duty to Crack Down on Homeopathic Fake Medicine, says Center for Inquiry," CFI reports on attacking homeopathy at the political top end. Awhile ago I saw some homeopathic medicines on sale in a local drug store. If I see them on sale again I could object to the store manager or to corporate in charge of the store chain or I could write a letter to the editor of our local paper criticizing the practice. Your readers could be encouraged to object at the bottom, consumer end, to the sale of homeopathic products.

In "Skepticism Reloaded," Amardeo Sarma emphasizes the importance of skeptics relying on scientific truth and rejecting pseudoscientific claims. However, Kendrick Frazier reports on a study showing that "Lies and False News Spread Faster, Farther Online Than Truth, Study Shows." Perhaps, keeping our status as skeptics associated with skeptical organizations under cover, we might utilize Frazier's observations of the power of fake news and spread the news that since the FDA has not approved homeopathic medicines, they may contain contaminants harmful to one's health.

Although one would not want the use of false news associated with skepticism, one can make a case for skeptics making clandestine use of it.

David W. Briggs
Marion, Massachusetts

Are We Skeptics Doing Things Right?

I've been a committed skeptic for a couple of decades and voraciously consume each issue of Skeptical Inquirer within a day or two of its arrival in the mail. However, I have to say that the most significant thing I've read in years is the letter from Sharon A. Hill in your July/August issue. Much as I enjoy reading about battles against specific examples of faulty thinking, I tend to feel that something of primary importance is being left out. What does it mean to be a skeptic, and what goals should I, as well as the community I identify with, be striving to achieve?

The only thing I'm sure about is the need to resist the discrimination that like-minded people and I face in our society. But how do we do that? Beyond that, I'm unsure of many things. Should my attitude toward religion be antagonism, coexistence, or cooperation toward achieving a mutual goal? Should my attitude toward fundamentalism be different than toward mainline or liberal religions? What about non-western religions? How can I make a political impact, seeing my loyalty is not with the Right or the Left but with rational thinking itself? How can I make an impact on the people I interact with every day? And how can the skeptical community affect society at large, knowing that the vast majority of people are never going to identify themselves as skeptics?

I long for a movement that can develop a clear philosophy about who we are and what we are trying to accomplish.

Kevin Gates
Hallstead, Pennsylvania

Sharon A. Hill makes some great points that align with a feeling I've had for some time. I worry that too many skeptics conflate science and technology. This was confirmed by L.G. Wade's letter, which asserts laws against GMOs are based on "false beliefs."

While advancing our knowledge through science has revolutionized society, no rational person can claim that our technological advances have been without problems or even that their developers identified those problems before making the technology available.

A clear case in point is the use of fossil fuels to drive industrial production. This produced massive social upheaval while polluting the air and water. Today climate change is viewed as an existential threat to our civilization.

Thomas Newcomen was just looking for a better way to keep mines from flooding. It would be unreasonable to expect him to have predicted cholera epidemics as workers crowded into cities once industry was freed from reliance on wind and water power.

The straw man arguments many skeptics make about GMOs having the same nutritional value as traditional crops ignore the broader concerns about their impact on the environment and the economics of farming. This technology has given us Roundup-ready crops that have already led to the predictable development of Roundup-resistant super weeds.

In protecting their commercial rights, GMO seed companies have taken legal action against farmers who follow the traditional practice of saving seeds. They have even taken legal action when GMO crops interbreed with other crops, including old varieties harvested by subsistence farmers.

When we move from advocating facts, evidence, and reason to being cheerleaders for technology, we undermine skepticism as surely as the postmodern philosophers Professor Sidky (in his cover article in the March/April 2018 SI) complained about.

Gary Dale
West Hill, Ontario, Canada

We hope readers will also have noticed Amardeo Sarma's essay, "Skepticism Reloaded," in the same issue; it discusses these and other issues, goals, practices, problems, and ideals of the skeptic movement. — Editors

The Pathology of Jihad

Islamic Jihad has gone beyond making "direct contact with modernity" ("The Anatomy and Pathology of Jihad," Special Report, July/August 2018), it's a thoroughly modern movement. The jihadists not only employ the latest communications technology and turned the West's hi-tech aircraft into weapons, the modern jihad has little in common with the old caliphate, which never tried to impose Universalist Islam.

Islamic Jihad is an expression of the Enlightenment impulse to "change the world," which spawned Democracy, Communism, Fascism, and the post-Christian values of Neoliberalism.

The error is not "sacralizing" democratic values—that's expected from a nontheistic religion—but in trying to impose Western values on cultures that have no indigenous, underlying experience with the Western faith of progress.

C.J. Michiels
Los Angeles, California

Changelings

I enjoyed Stuart Vyse's column "The Enduring Legend of the Changeling" (July/August 2018) and noticed a small error in the text, which I hope he won't mind me pointing out. While Clint Eastwood did indeed direct the 2008 film *Changeling*, he was not, as stated in the article, involved in the earlier 1980 Canadian horror film *The Changeling*, which was directed by Peter Medak.

Martin Stubbs
London, England

Falsely Equating

In his reply to a question in the July/August issue Benjamin Radford writes on p. 29, "Israel and Iran want to blow each other off the face of the Earth ... ." While the leaders of Iran have called Israel a "cancerous tumor" that they want to eradicate, I have seen no evidence that Israel wants to "blow Iran off the face of the earth." In fact, Israel had good relations with Iran until Muslim religious fanatics took over the government.

In recent years, as lies are spreading much faster than truth, I have seen an increasing amount of information distortion where two things that have little in common are declared to be equivalent. In this case Radford falsely equates Iran's goal of destroying Israel with Israel's goal of defending itself against Iran.

John Grant
Baltimore, Maryland

Benjamin Radford replies:

I was not attempting to accurately characterize the complex relations between Israel and Iran in the context of a passing sarcastic rhetorical question in a column on UFO conspiracy theories. The point was that the two countries have long been enemies, and regardless of any declarations or hyperbolic threats neither country has destroyed the other. In April 2018 Israel's defense minister, Avigdor Lieberman, stated that any Iranian attack on Tel Aviv would be met with a responsive strike on Tehran, and Prime Minister Benjamin Netanyahu threatened a military attack on Iran—in the absence of an offensive strike on Israel—should that country attempt to block the Baab al-Mandeb Strait in the Red Sea.

Object Orientation

Concerning the Curious Christmas Light problem (Skeptical Inquirer, May/June 2018): I enjoy the occasional articles providing explanations for apparently anomalous phenomena, but I believe the solution given in this case is erroneous.

The article gives geometrical constructions (lines S from shadows) which roughly converge to give an estimate of the sun's position (B). It then drops a vertical line V and concludes that *the mystery glowing spot is directly beneath the sun*.

But I believe gravity does not affect the light trajectory —so the ideas of *vertical* and *beneath* are irrelevant.

Instead, the lens flare hypothesis predicts that the flare image A lie within the same plane as the sun B and the camera axis. The latter is normally the center of the image C, located by the diagonal lines. This gives a discrepancy of 30 degrees.

Unless the image has been cropped, in which case the analysis can be re-done with the true center.

Ian Bryce
Chief Investigator, Australian Skeptics
Sydney, Australia

For the Record

In the article "From the Spectral to the Spectrum: Radiation in the Crosshairs" (September/October 2018), late changes in proof resulted in an unclear sentence (in the final full paragraph on page 40). It should have read: "In some cases, they may decline to undergo an imaging study that might have led to an unsuspected diagnosis or to detection of disease at a curable stage."

[FEEDBACK

The letters column is a forum on matters raised in previous issues. **Letters should be no longer than 225 words**. Due to the volume of letters we receive, not all can be published. Send letters as email text (not attachments) to letters@csicop.org. In the subject line, provide your surname and informative identification, e.g.: "Smith Letter on Jones evolution article." Include your name and address at the end of the letter. You may also mail your letter to the editor to 944 Deer Dr. NE, Albuquerque, NM 87122.

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prof. of behavioral studies in
education, Oklahoma City Univ.

John F. Fischer,
forensic analyst, Orlando, FL

Eileen Gambrill,
prof. of social welfare,
Univ. of California at Berkeley

Luis Alfonso Gámez,
science journalist, Bilbao, Spain

Sylvio Garattini,
director, Mario Negri Pharmacology
Institute, Milan, Italy

Susan Gerbic,
founder and leader of the Guerilla Skepticism on Wikipedia (GSoW) project

Laurie Godfrey,
anthropologist, Univ. of Massachusetts

Gerald Goldin,
mathematician, Rutgers Univ., NJ

Donald Goldsmith,
astronomer; president, Interstellar Media

Alan Hale,
astronomer, Southwest Institute for Space
Research, Alamogordo, NM

Clyde F. Herreid,
prof. of biology, SUNY Buffalo

Sharon Hill,
geologist, writer, researcher, creator and
editor of the *Doubtful News* blog

Gabor Hrasko,
chairman of the European Council of Skeptical Organizations (ECSO), president
of Hungarian Skeptics

Michael Hutchinson,
author; Skeptical Inquirer
representative, Europe

Philip A. Ianna,
assoc. prof. of astronomy,
Univ. of Virginia

I.W. Kelly,
prof. of psychology, Univ. of Saskatchewan,
Canada

Richard H. Lange,
MD, Mohawk Valley Physician
Health Plan, Schenectady, NY

William M. London,
California State Univ., Los Angeles

Rebecca Long,
nuclear engineer, president of Georgia
Council Against Health Fraud, Atlanta, GA

John R. Mashey,
computer scientist/executive (Bell
Labs, then Silicon Valley), analyst of
climate-change denial, contributor to
DeSmogBlog and Skeptical Science, Portola
Valley, CA

Thomas R. McDonough,
astrophysicist, Pasadena, CA

James E. McGaha,
astronomer, USAF pilot (ret.)

Joel A. Moskowitz,
director of medical psychiatry, Calabasas
Mental Health Services, Los Angeles

Matthew C. Nisbet,
professor of communication studies, public
policy, and urban affairs at Northeastern
University

Julia Offe,
neurobiologist, science journalist, creator
of German Science Slam

John W. Patterson,
prof. of materials science and
engineering, Iowa State Univ.

James R. Pomerantz,
prof. of psychology, Rice Univ.

Tim Printy,
amateur astronomer, UFO skeptic, former
Navy nuclear reactor operator/division
chief, Manchester, NH

Daisie Radner,
prof. of philosophy, SUNY Buffalo

Robert H. Romer,
prof. of physics, Amherst College

Karl Sabbagh,
journalist, Richmond, Surrey, England

Robert J. Samp,
assistant prof. of education and
medicine, Univ. of Wisconsin-Madison

Steven D. Schafersman,
asst. prof. of geology, Miami Univ., OH

Chris Scott,
statistician, London, England

Stuart D. Scott Jr.,
associate prof. of anthropology,
SUNY Buffalo

Erwin M. Segal,
prof. of psychology, SUNY Buffalo

Carla Selby,
anthropologist/ archaeologist

Steven N. Shore,
prof. of astrophysics, Univ. of Pisa, Italy

Waclaw Szybalski,
professor, McArdle Laboratory, Univ.
of Wisconsin–Madison

Sarah G. Thomason,
prof. of linguistics, Univ. of Pittsburgh, PA

Tim Trachet,
journalist and science writer, honorary
chairman of SKEPP, Belgium

David Willey,
physics instructor, Univ. of Pittsburgh, PA

Affiliated Organizations | United States

ALABAMA
Alabama Skeptics, Alabama. Emory Kimbrough. Tel.: 205-759-2624. 3550 Watermelon Road, Apt. 28A, Northport, AL 35476

ARIZONA
Tucson Skeptics Inc. Tucson, AZ. James McGaha. Email:mcgaha@skepticus.com. 5100 N. Sabino Foothills Dr., Tucson, AZ 85715

Phoenix Area Skeptics Society (PASS) http://phoenixskeptics.org
Email: phoenixskeptics@gmail.com

Phoenix Skeptics, Phoenix, AZ. Michael Stackpole, P.O. Box 60333, Phoenix, AZ 85082

CALIFORNIA
Sacramento Organization for Rational Thinking (SORT) Sacramento, CA. Ray Spangenburg, co-founder. Tel.: 916-978-0321; Email: kitray2@comcast.net. PO Box 2215, Carmichael, CA 95609-2215 http://home.comcast.net/~kitray2/site/

Bay Area Skeptics (BAS) San Francisco–Bay Area. Eugenie C. Scott, President. 1218 Miluia St., Berkeley, CA 94709. Email: scott@ncse.com. www.BASkeptics.org

Independent Investigations Group (IIG), Center for Inquiry–Los Angeles, 4773 Hollywood Blvd, Los Angeles, CA 90027. Tel.: 323-666-9797. www.iighq.com

Sacramento Skeptics Society, Sacramento. Terry Sandbek, President. 4300 Auburn Blvd. Suite 206, Sacramento CA 95841. Tel.: 916 489-1774. Email: terry@sandbek.com

San Diego Association for Rational Inquiry (SDARI) President: Tom Pickett. Email: pickett.thomasj@gmail.com. Program/general information 619-421-5844. www.sdari.org. Postal address: PO Box 623, La Jolla, CA 92038-0623

CONNECTICUT
New England Skeptical Society (NESS) New England. Steven Novella M.D., President. Tel.: 203-281-6277; Email: board@theness.com. 64 Cobblestone Dr., Hamden, CT 06518 www.theness.com

D.C./MARYLAND
National Capital Area Skeptics NCAS, Maryland, D.C., Virginia. D.W. "Chip" Denman. Tel.: (240) 670-6227. Email: ncas@ncas.org. PO Box 8461, Silver Spring, MD 20907-8428 http://www.ncas.org

FLORIDA
Tampa Bay Skeptics (TBS) Tampa Bay, Florida. Rick O'Keefe, contact person. Tel.: 813-505-7013; Email: tbs@centerforinquiry.net. c/o O'Keefe, 4011 S. Manhattan Ave. #139, Tampa, FL 33611-1277. www.tampabayskeptics.org

ILLINOIS
National Examination Association of Lincoln Land (REALL) Illinois. Bob Ladendorf, Chairman. Tel.: 217-546-3475; Email: chairman@reall.org. PO Box 20302, Springfield, IL 62708 www.reall.org

Chicago Skeptics Jennifer Newport, contact person. Email: chicagoskeptics@gmail.com. www.chicagoskeptics.com

LOUISIANA
Baton Rouge Proponents of Rational Inquiry and Scientific Methods (BR-PRISM) Louisiana. Marge Schroth. Tel.: 225-766-4747. 425 Carriage Way, Baton Rouge, LA 70808

MICHIGAN
Great Lakes Skeptics (GLS) SE Michigan. Lorna J. Simmons, Contact person. Tel.: 734-525-5731; Email: Skeptic31@aol.com. 31710 Cowan Road, Apt. 103, Westland, MI 48185-2366

Tri-Cities Skeptics, Michigan. Dr. Gary Peterson. Tel.: 989-964-4491; e-mail: peterson@svsu.edu. www.tcskeptics.blogspot.com

MINNESOTA
St. Kloud Extraordinary Claim Psychic Teaching Investigating Community (SKEPTIC) St. Cloud, Minnesota. Jerry Mertens. Tel.: 320-255-2138; Email: gmertens@stcloudstate.edu. Jerry Mertens, Psychology Department, 720 4th Ave. S, St. Cloud State Univ., St. Cloud, MN 56301

MISSOURI
Skeptical Society of St. Louis (SSSL) St. Louis, Missouri. Michael Blanford, President. Email: info@skepticalstl.org. 2729 Ann Ave., St. Louis, MO 63104 www.skepticalstl.org

St. Joseph Skeptics
P.O. Box 8908
St. Joseph MO, 64508-8908

NEVADA
Reno Skeptical Society, Inc.,
Brad Lutts, President.
Tel.: (775) 335-5505;
Email: info@RenoSkeptics.org. 18124 Wedge Parkway #1052 Reno, Nevada 89511. www.RenoSkeptics.org

NEW MEXICO
New Mexicans for Science and Reason (NMSR) New Mexico. David E. Thomas, President. Tel.: 505-869-9250; Email: nmsrdave@swcp.com. 801 Fitch Ave., Socorro, NM 87801. www.nmsr.org

NEW YORK
New York City Skeptics Michael Feldman, president. PO Box 5122 New York, NY 10185. www.nycskeptics.org

Central New York Skeptics (CNY Skeptics) Syracuse. Lisa Goodlin, President. Tel: (315) 636-6533; Email: info@cnyskeptics.org, cnyskeptics.org PO Box 417, Fayettville, NY 13066

OHIO
Central Ohioans for Rational Inquiry (CORI) Central Ohio. Charlie Hazlett, President. Tel.: 614-878-2742; Email: charlie@hazlett.net. PO Box 282069, Columbus, OH 43228

Cleveland Skeptics Joshua Hunt, Co-Organizer, www.clevelandskeptics.org

South Shore Skeptics (SSS) Cleveland and counties. Jim Kutz. Tel.: 440 942-5543; Email: jimkutz@earthlink.net. PO Box 5083, Cleveland, OH 44101 www.southshoreskeptics.org

Association for Rational Thought (ART) Cincinnati. Roy Auerbach, president. Tel: (513)-731-2774, Email: raa@cinci.rr.com. PO Box 12896, Cincinnati, OH 45212. www.cincinnati skeptics.org

OREGON
Oregonians for Science and Reason (04SR) Oregon. Jeanine DeNoma, president. Tel.: (541) 745-5026; Email: wilkinsa@peak.org; 39105 Military Rd., Monmouth, OR 97361. www.04SR.org

PENNSYLVANIA
Philadelphia Association for Critical Thinking (PhACT), Bob Glickman President. 653 Garden Road Glenside PA 19038. 215-885-2089 E-mail: President@phact.org. Website: www.phact.org

TENNESSEE
Rationalists of East Tennessee, East Tennessee. Carl Ledenbecker. Tel.: (865)-982-8687; Email: Aletall@aol.com. 2123 Stonybrook Rd., Louisville, TN 37777

TEXAS
North Texas Skeptics NTS Dallas/Ft Worth area, John Blanton, Secretary. Tel.: (972)-306-3187; Email: skeptic@ntskeptics.org. PO Box 111794, Carrollton, TX 75011-1794. www.ntskeptics.org

VIRGINIA
The James Randi Educational Foundation. James Randi, Director. 2941 Fairview Park Drive, Suite 105 Falls Church, VA 22042
Email: jref@randi.org
Telephone: 571-318-6530

Science & Reason, Hampton Rds., Virginia. Lawrence Weinstein, Old Dominion Univ.-Physics Dept., Norfolk, VA 23529

WASHINGTON
Seattle Skeptics
www.seattleskeptics.com

The organizations listed above have aims similar to those of the Committee for Skeptical Inquiry but are independent and autonomous. Representatives of these organizations cannot speak on behalf of CSI. Please send updates to Barry Karr, P.O. Box 703, Amherst NY 14226-0703.
International affiliated organizations listed at www.csicop.org.

CENTERS FOR INQUIRY
www.centerforinquiry.net/about/branches

Transnational
3965 Rensch Road, Amherst, NY 14228
Tel.: (716) 636-4869

Austin
PO Box 300036, Austin, TX 78703
Tel.: (512) 454-0977

Chicago
chicago@centerforinquiry.net

Indianapolis
350 Canal Walk, Suite A, Indianapolis, IN 46202
Tel.: (317) 423-0710

Los Angeles
4773 Hollywood Blvd., Hollywood, CA 90027
Tel.: (323) 666-9797

Michigan
3777 44th Street SE, Grand Rapids, MI 49512
Tel.: (616) 698-2342

New York City
33-29 28th St. Astoria, NY 11106

San Francisco
email: sf@centerforinquiry.net

Tampa Bay
4011 S. Manhattan Ave. #139, Tampa, FL 33611-1277
Tel.: (813) 505-7013

Washington, DC
1012 14th Street., NW, Suite 205
Washington, DC 20005
tel.: (202) 733-5275

Argentina
Buenos Aires, Argentina
alejandroborgo@gmail.com
Facebook: CFI Argentina

Canada
55 Eglinton Ave. East, Suite 307
Toronto, Ontario, M4P 1G8, Canada

China
China Research Institute for Science Popularization,
NO. 86, Xueyuan Nanlu Haidian Dist., Beijing,
100081 China
Tel.: +86-10-62170515

Egypt
44 Gol Gamal St., Agouza, Giza, Egypt

France
Dr. Henri Broch, Universite of Nice, Faculte des Sciences, Parc Valrose, 06108, Nice cedex 2, France Tel.: +33-492-07-63-12

Germany
Arheilger Weg 11, 64380 Rossdorf, Germany
Tel.: +49-6154-695023

India
46 Masi garh, New Friends Colony
New Delhi 110025
Tel.: 91-9868010950

London
Conway Hall, 25 Red Lion Square,
London WC1R 4RL, England

Nepal
Humanist Association of Nepal,
PO Box 5284, Kathmandu Nepal
Tel.: +977-1-4413-345

New Zealand
email: bcooke@centerforinquiry.net

Nigeria
PO Box 25269, Mapo, Ibadan, Oyo State, Nigeria
Tel.: +234-2-2313699

Peru
Ex. Dir. Manuel Paz-y-Miño
Calle El Corregidor 318, Rimac, Lima 25-PERU
email: humanarazon_peru@yahoo.com

Poland
Lokal Biurowy No. 8, 8 Sapiezynska Sr.,
00-215, Warsaw, Poland

Romania
Fundatia Centrul pentru Constiinta Critica
Tel.: (40)-(0)744-67-67-94
email: CenterforInquiry.Romania@gmail.com

Russia
Dr. Valerii A. Kuvakin, 119899 Russia, Moscow,
Vorobevy Gory, Moscow State Univ.,
Philosophy Department

Senegal
PO Box 15376, Dakar – Fann, Senegal
Tel.: +221-501-13-00

CENTER FOR INQUIRY